ASSESSMENT OF COMPUTERIZED SYSTEMS IN THE AREA OF SIDON

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D E D I C A T I O N

To those who Inspired me
and I deeply love,

My father
My mother
Najwa, May, Aaesha, & Nadeen

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CHAPTER I

INTRODUCTION

General Background

"Sidon lies on a sandy cape on the Mediterranean Sea (latitude 33° 34" North - longitude 35° 23" East). It is about 45 kms to the south of Beirut and 40 Kms to the North of Tyre. The coastal plain of Sidon which is two to three kms wide between the Lebanon west chain of mountains and the Mediterranean Sea is rich in water, fertile, and has variety of fruits and vegetables."[1]

"The name Sidon is ascribed to Sidoon Ben Sedka Ben Kenaan Ben Noah. But the majority of historians ascribed it to Semitic root 'Seid' which means 'fish' or 'fishing'."[2] Sidon is the only Lebanese city whose name is stated in the Old Testament. Moreover, Its name is stated in The Iliad of Hommer .[3]

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[1] Saida 81 (Sidon: Al-Janoub Press, 1981), p. 21.

[2] Ibid., pp. 21-22

[3] Abed Rehman Hijazi, Maalem Saida Al-Islamieh [The Islamic Features of Sidon] (Sidon: Al-Assrieh Press, 1984), p. 8.

Encyclopaedia Britannica defines the city of Sidon as "a fishing, trade, and market centre for an agricultural hinterland"[4]. "It is believed that the Phoenicians built Sidon in the year 2800 B.C. on the coast of the Mediterranean Sea. This means that Sidon is about 5000 years old. It is considered an inveterate city with a long history full of great events."[5] "After the announcement of 'Grand Lebanon' in 1920, Sidon became a governorate by the name of 'South Leban Governorate'. After the that it was called 'The Governorate of South Lebanon'. Since then Sidon has been the capital to the governorate."[6]

As it is well known economically, Sidon is the third city in Lebanon in size. During the 1980s, Sidon witnessed a great development in most economic and non-economic fields. This development called for a certain change in dealing with this increasing economical growth. Thus, business computer systems were to be used.

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[4] Encyclopaedia Britannica, ed 15th, 1989. s.v. "Sidon".

[5] Saida 88 (Sidon: Al-Janoub Press, 1988), p.19

[6] Ibid., p.24

Nowadays, computers are being used more or less in all fields all over the world. Such as accounting, payroll, stocks, personnel, medical care, sports, media, etc. Computers are helpful in maintaining Data-Bases and Management Information services . Management has a great interaction with information processing within the context of the entire organization. " The role of information processing has become pervasive in all organizations."[7] The growth of data processing, or as it is increasingly called, "Management Information Systems", is an expanding phenomenon in all organizations irrespective of size. Surely, the expansion requires technology specifically, Computerized Systems.

The expansion of the use of computers and concomitant technology advances in both the hardware (computer machines) and software (computer programs and packages) has not been limited to the business firms only but also involved many other types of firms. The computer and its software, in whatever form, be it a personal

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[7] John P. Murry Managing Information Systems as a Corporate Resource (Illinios : Dow Jones-Irwin, 1984), p. vii.

computer, a word processor, an electronic accountant, or mail system, has begun to invade all areas of the organizations since the 1970s. For instance, "Secretaries use word processors instead of typewriters, marketing analysts use electronic spreadsheets instead of wide sheets of accounting paper, executive assistants employ graphics packages instead of drawing boards to produce charts for board room"[e].

The main part of data is gathered through a questionnaire. The area covered is Sidon and its suburbs, especially Al-Ghazieh. The names and addresses of the biggest organizations are listed by the "Chamber of Commerce & Industry" in Sidon. Interviews with the managers or executives of the organizations are to be conducted. Other Secondary sources of data are published materials that will be used for review of literature.

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[e] David M. Kroenke and Kathleen A. Dolan, Business Computer Systems (Singapore : McGraw Hill Book Co.,1989), p. 4.

The type of organizations considered is private. Organizations and firms will be classified into categories depending on the type of business or field the organization works in; such as industrial, agricultural, commercial, banking, contracting, medical centers, cultural organization, service organization , educational systems, and social associations .

Research Question

In this study the main question addressed is : Has the economic development that witnessed the area of Sidon hasten the usage of the computer systems ?

Statement of The Purpose

The assessment of computerized systems involves many aspects. First of all, we need to know the type of the computer hardware , or technology, being used in the area of Sidon. There are many types of computer hardware such as micro-computers, mini-computers, mainframe-computers and recently, super-computer. Any type of these computer hardwares may consist of at least central processing unit , C.P.U. , main memory, terminals, in

addition to printers, disk drives, tape drives, and others. Secondly, The type of software being used, is it a general software that is being sold in the market or a special software made by either the organization computer department or a software company; and what sostware languages are being used? Thirdly, in which fields this computer system is being used? That is, what are the tasks that are being computerized? In addition to, the fields in which the computer systems have replaced the manual work. Thus, this research will asses four components of the business computer system.

CHAPTER II

REVIEW OF LITERATURE

2.1 The Economic Situation in the Area of Sidon

From the late 1970s, the city of Sidon and its suburbs, especially Al-Ghazeih, has had a relatively significant economic development until the beginning of the 1990s. Although in 1982, the Israeli occupation had caused some recession, in 1985 the economic cycle was partially restored , in some fields, not only to its normal situation but also with more development.

Before going further, the opinion of the chairman of the Chamber of Industry and Commerce in Sidon and the South , Mr. Muhammad Al-Zaatary, will be stated. According to Mr. M. Zaatary, The civil war in Lebanon has negatively affected the usage of the computer technology . The unstable security situation has impeded the mere thought of implying and using computer systems. During the civil war, the computer technology was running in a continuum development in the world; while in Lebanon, the social and

economical situation was going backward. In spite of this bad situation, some adventure organizations used the computer technology but only in few areas of their organization. The civil war has led to a hyper-inflation in addition to a shortage in electric power and weakness in telephone and wire communications . These shortages make it imperative that any organization irrespective of its type of business is in need of a computer.[1]

The area of Sidon, like any other Lebanese area, has been definitely affected by the civil war. But the area of Sidon has had many periods during which it prospered economically. Many economic developments can clearly be noticed through infrastructure projects, the increase in the number of both industrial and commercial organizations, new kinds of business, some organizations have become agents of some international trademarks (there is no more any need to an intermediate trader in Beirut).[2]

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[1] Interview with Muhammad Zaatary, the Chairman of the Chamber of Industry and Commerce in Sidon & the South, Sidon, 28 July 1990.

[2] Ibid.

There are many factors which helped the economic development in Sidon and its area. First of all, due to the war in South Lebanon, many Lebanese came from the South and lived in the area of Sidon. They established few firms and the number of workers increased. Also, the civil war in Beirut had forced many business firms to open branches in Sidon. Although the Lebanese civil war has covered more or less all areas in Lebanon, Sidon was considered relatively secure. Forth, the public services such as water, electricity, telephone, & telex had been run normally until 1988. In 1989, the electricity has been reduced to be given 6hrs/18hrs (33 %). Fifth, Sidon is the main market for South Lebanon, Iquleem Al-Kharoub, Jezzin area, and the most of West Bekaa.[3] Finally, the available of necessary capital for industrial projects with immigrants.

In economical development, the total Industrial exports of Sidon and the south was 1,800 million Lebanese Pound in 1987. In 1988 it was 2,500 million Lebanese pounds and it was 2,900 million Lebanese pounds in the first nine months.[4] Moreover, The Lebanese exports approved by the

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[3] Alliwaa : South Lebanon Appendix (Beirut, 1989). p. 44.

[4] Ibid., p. 24.

Chamber of Commerce and Industry in Sidon and the South hadincreased considerably during 1988 with respect to 1987. It reached up to 10,875 million Lebanese pounds. These exports reached 6,774.4 million Lebanese pounds in the first half of 1988 and to 21,447.6 in the first half of 1989.[5]

On the other hand, Sidon witnessed a significant development in various fields of public life. In addition to a series of municipal constructions which left an important economic impact on the general situation in Sidon, namely the public roads that form 15% of the city.[6]

According to the Chamber of Commerce and Industry in Sidon and the South records, The main kinds of industries in the area of Sidon are :

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[5] Alliwaa : South Lebanon Appendix , p. 37.

[6] Ibid., p. 13.

1. Furniture
2. Textile
3. Dying of Animal skin
4. Flagstone
5. Ironsmith business and production of iron doors, windows , & gates
6. Arabic and european sweets
7. Soap & dies derivatives
8. Halawa, Tahina, and chocolate
9. Packing food materials
10. Leather, shoes and dyed leather
11. Maintenance of Jewelry
12 Packing of fruits & citrus
13. Nylon sacks
14. Digging water-wells
15. Refrigeration & air conditioning
16. Assembling electrical equipments
17. Fishing boats
18. Carton
19. Ready made clothes
20. Aluminum doors and windows
21. Laban, Labneh, Cheese

A study of Table #2.1 shows that even though the number of commercial organization is more than four times of industrial organization both are rapidly increasing over the time. (see figure # 2.1)

Table # 2.1
Number of Organizations Recorded in the Chamber of Industry & Commerce

Year	Industrial	Commercial	Total
1984	26	118	144
1985	25	156	181
1986	28	221	249
1987	123	760	883
1988	168	672	840
1989	113	455	568

SOURCE : Chamber of Industry & Commerce

The number of commercial firms and shops that are registered in the official commercial record has significantly increased. Table #2.2 reveals that. (see figure #2.2)

Table # 2.2 : The number of Commercial firms registered in the commercial record

Year	Number of Firms
1977	1,019
1978	1,633
1979	2,035
1980	2,849
1981	3,366
1982	4,331
1983	5,380
1984	5,700
1985	6,071
1986	6,603
1987	7,703
1988	8,174
1989	8,868
1990	9,191

SOURCE : Commercial Register in Sidon

Inspecting Table #2.3 indicates another economic development that is the records of Al-Janoub Press firm, a media firm, which shows an increase in the number of advertised firms. (see figure # 2_3).

Fig.2_1 #of firms record.at chamber I&C

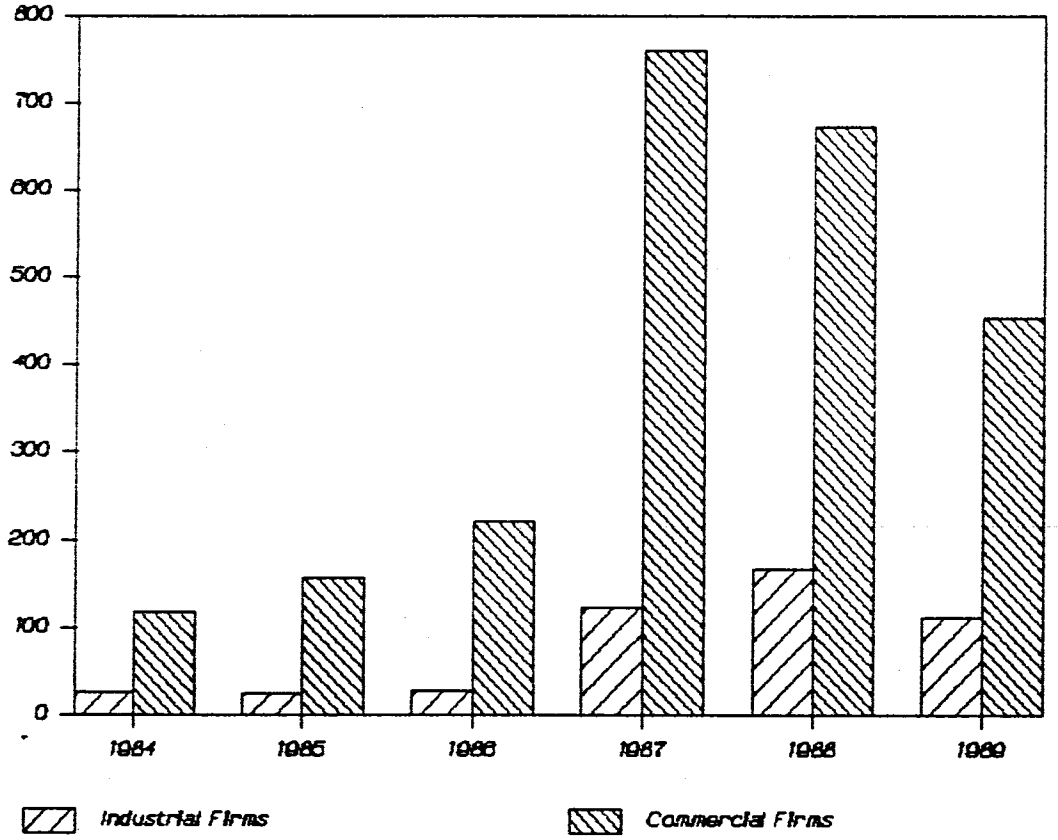


Fig.2_2 # of commercial record's firms

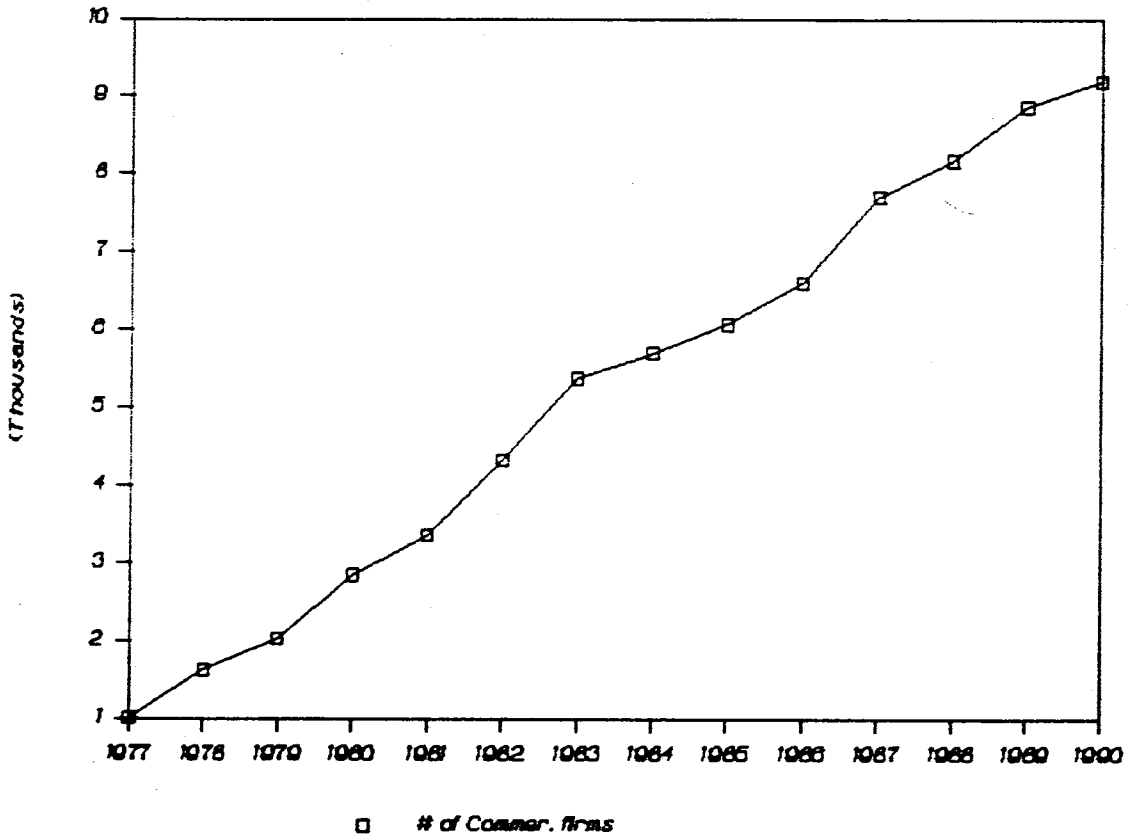
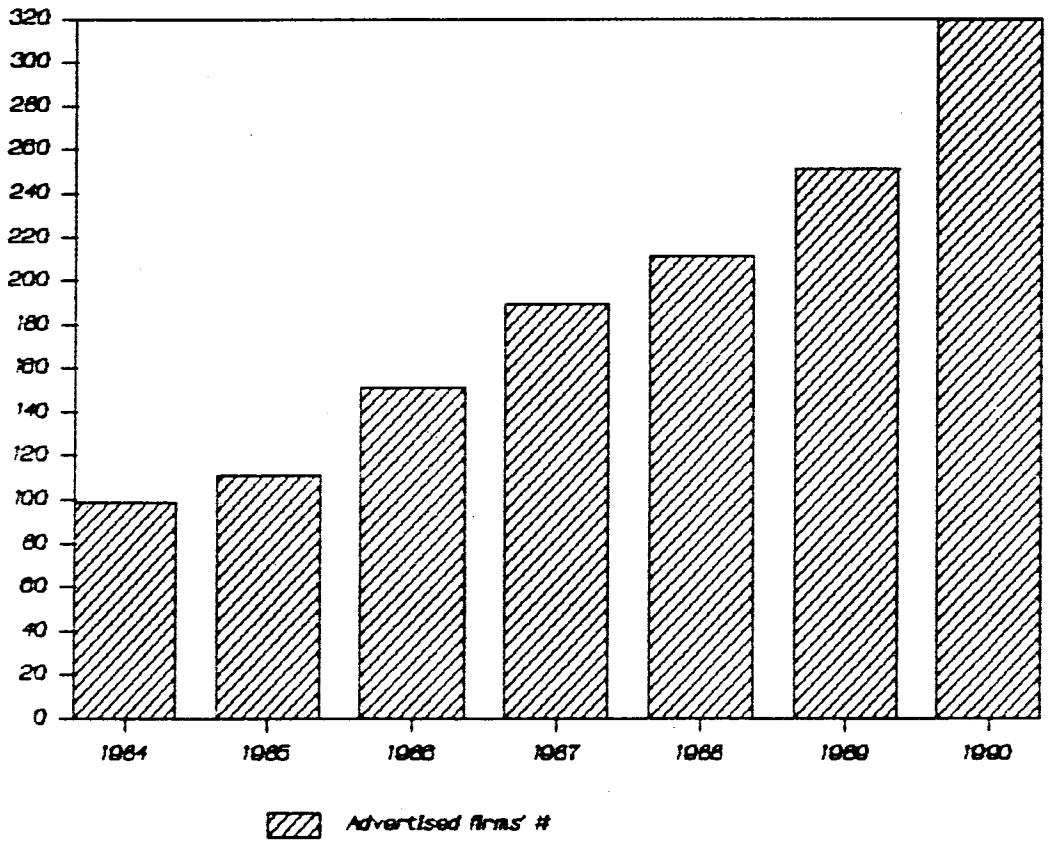


Table # 2.3
The # of firms Advertised at AJP

Year	# of Advertised Firms
1984	100
1985	110
1986	150
1987	200
1988	211
1889	251
1990	320

SOURCE : Al-Janoub Press (Sidon)

Fig.#2_3 Advertised Firms # at AJ.P.



2.2 The Importance of the Role of Computer in Management Information Systems

Computers provide Knowledge when it is needed and relevant.[7] The idea to use computers is to support office workers. "There is almost a palpable desire in many organizations to use data processing technology, even when that technology is little understood."[8] The use of well-designed management information system is an important aspect of the movement to the increase in flexibility and improvement in the service of management. "With the advent of large-scale computers the amount and types of information used in organization has increased greatly over the past two decades."[9]

There are important reasons to learn the know how of business data processing and the computer systems: "computers have changed business at all levels, computers are getting cheaper all the time, (they will see

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[7] "Smart Advice From Dumb Machines" The Economist, February 11 1989, p.65.

[8] John P. Murry, Managing Information Systems as a Corporate Resource (Ilinois : Dow Jones-Irwin, 1984), p. 3.

[9] Dan Voich Jr, Homor J. Mottice, William A Shrode, Information Systems for Operations and Management (Chicago: South-Western Publishing Co.) , p.44.

increased use in business and industry), and computers can enable people to be more productive. Many business people will be successful because of their ability to incorporate computer technology into their jobs."[10].

Those organizations which adopt a well-planned, organized, concerted effort to move to computerized systems and which see the effort through to completion will not only greatly improve the effective utilization of the data processing resources within the organization, but they will also enhance their competitive edge in a number of ways.Conversely, those organizations which choose to ignore the potential of the computerized systems will find themselves in a reactive, catch-up mode which may cause them real harm.[11] Thus, it would be impossible to run a modern business efficiently without the use of computers.

Computers not only lower the cost of running a business; they also improve the performance of business. Computers make it possible to create better and more reliable products, better and more reliable services, and a society with higher living standards.[12]

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[10] David M. Kroenke and Kathleen A. Dolan, Business Computer Systems (Singapore: McGraw Hill Book Co.,1989), p. 30.

[11] John P. Murry, p. 101.

[12] Andrew Vazonyi. Introduction to Data Processing (Illinois: Richard D. Irwin, Inc., 1980), p 14.

Advances in technology both in hardware, in terms of reduced cost and in software, in terms of an expanding array of user friendly' programming languages have made the concept of computerized data processing much more practical than before .

One of the major important functions of computer systems is to support managers. Managers must be knowledgeable about computers and data processing. They must make the decision of whether or not a computer system should be acquired and how it should be used. When managers are faced the decision of installing information systems, it is not enough to consider advantages and disadvantages in general. They must also thinks in terms of ecomonics, values, costs, and benefits. The manager must also understand the psychological and social aspects of the origination to be able to appraise the operational soundness of a computer installation. The modern manager is considered a decision maker and must have information on which to base decisions.[13]

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[13] Andrew Vazonyi, p. 18

It must be noticed that the computerized systems are not being installed to replace people with machines but to increase productivity, to make the work being done more interesting and challenging, and to help reduce much of the difficult, tedious manual work . If should be noticed as carefully as possible, that regardless of personal feelings, the use of computers will increase, that people who do not develop the required skills will, in time, find themselves and their skills automated. "The higher quality software available today provides a great deal of programmed instruction which can make learning the use of equipment on an independent basis very practical."[14]

According to Mr. M. Zaatary, Computers share part of the process in many organizations but in a very primitive and limited way in the area of Sidon. He considers the organizations that use computers as adventure ones. Most computers are only being used in the administration field in the organizations. That is, the industrial organizations are not using the computer in the assembly-line process of the production. Similarly for the agricultural organizations.[15]

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[14] Andrew Vazonyi, p.37.

[15] Interview with Muhammad Zaatary, the Chamber of Industry and Commerce in Sidon & the South, Sidon, 28 July 1990.

2.3 Business Computer System

Business computer systems can provide different services for different users within a company. Every area of business has potential to benefit from computerization. A business computer system is more than just a computer (hardware); it also includes programs (software), data, procedures, and trained qualified people. (see figure #2.4).[16]

2.3.1 Components of the Computer Hardware

The term computer is generally applied to a collection of devices that together are technically known as a computer system. This system consists of functional components, or part, for input, storage, control, processing, and output.[21] The minimum hardware requirement of a computer system are C.P.U., main memory, despicable screen, keyboard, auxiliary storage. The heart of the computer is the central processing unit , C.P.U. In most

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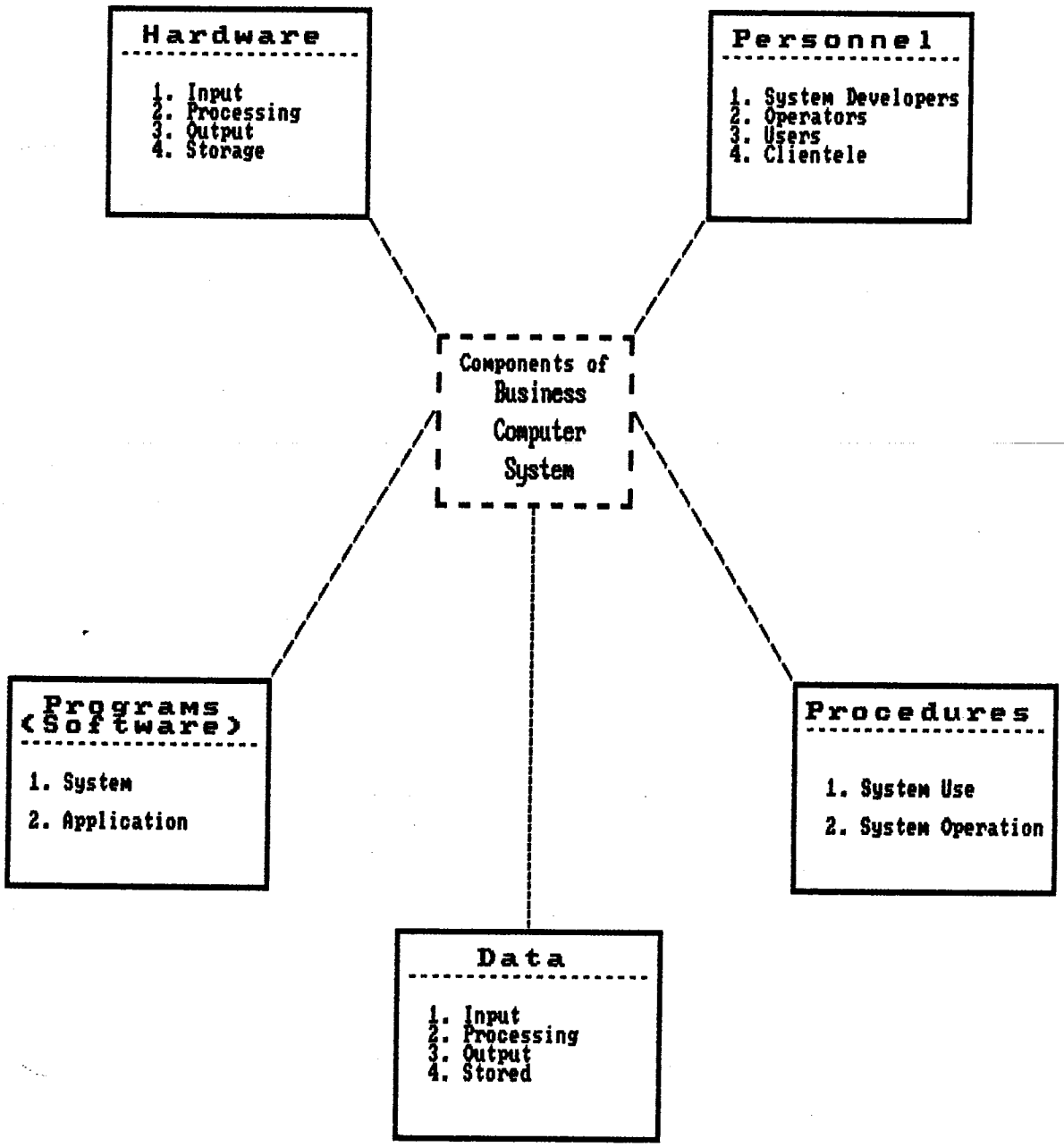
[16] David M. Kroenke and Kathleen A. Dolan, p. 30.

Figure #2.4 Components of a Business Computer System



personal computers, the central processing unit is connected to a bus; the bus is a communication device, really a connection, among various parts of the computer.[17] Figure #2.5 represents a chart of the computer hardware.

One particular computer hardware may be appropriate for one institution and inappropriate for another. There should be some features in any computer hardware which are relevant such as :

1. Internal memory size
2. Cycle speed of system processing.
3. Number of channels for input, output, and communications.
4. Characteristics of display and communication components.
5. Types and number of auxiliary storage units that can be attached.
6. Systems support and utility software provided or available.[18]

It is convenient to classify hardware according to its function in relation to data. Thus, the basic categories of hardware are input, storage, output, and processing hardware.

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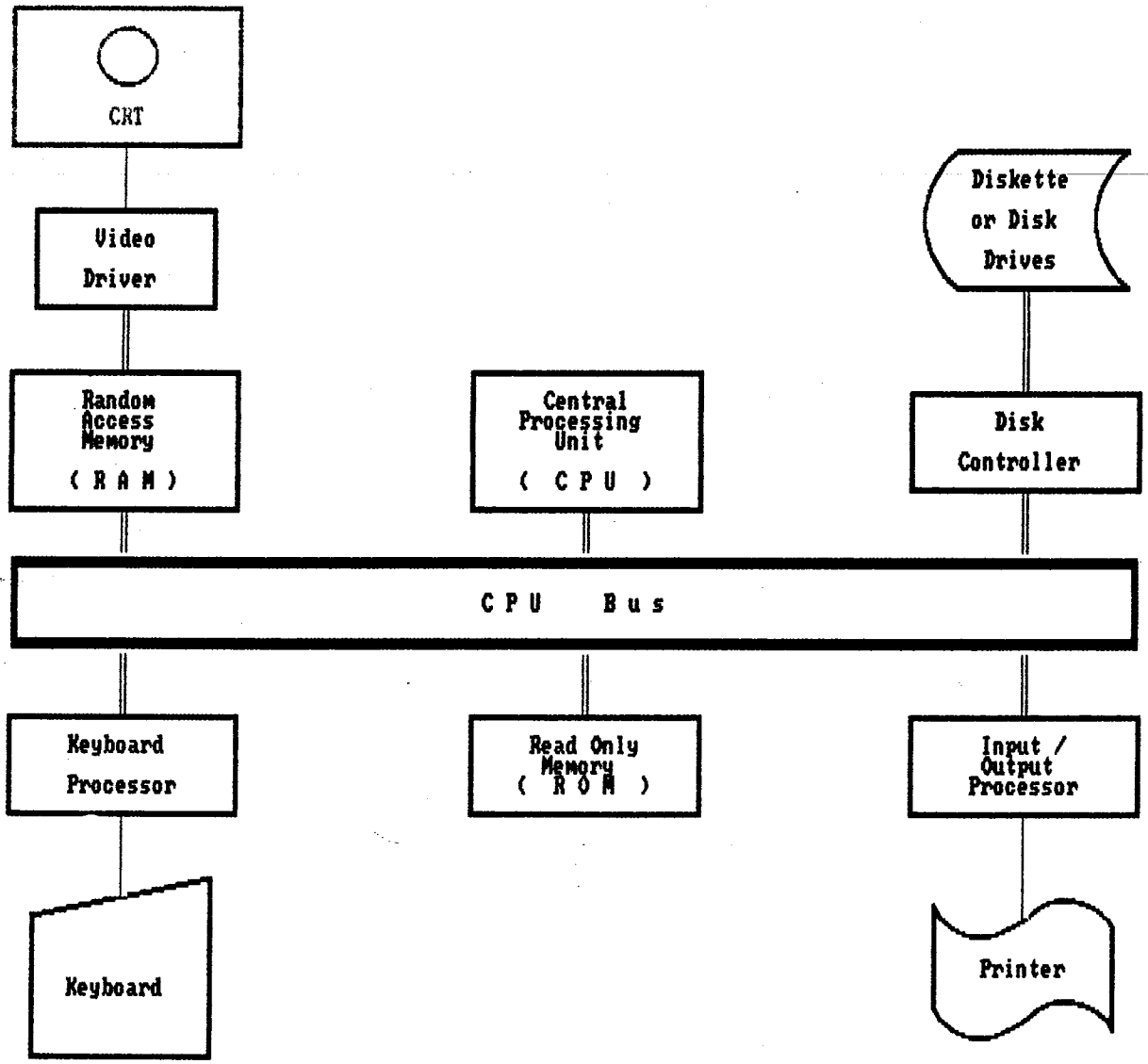
[17] Henry C. Lucas, Information Systems Concepts for Management (NewYork : McGraw Hill Book Co., 1986), p.114.

[18] James A. Senn Analysis and Design of Information System (Singapore: McGraw Hill Book Co.,1988), p. 585.

Figure #2.5 Components of the Computer Hardware



Input Hardware

Probably the most common device in use today is the terminal. A computer terminal is actually made of keyboard and CRT (Cathode-Ray-Tube). Other types of input hardware are key-to-disk and key-to-tape. That is, data that is entered is copied onto magnetic disk or tape.[19]

Additional input hardware include: Optical Character Recognition (OCR) device , which reads the character produced by credit cards; Magnetic Ink Character Recognition (MICR) devices, which read the ink on checks; Uniform Price Code (UPC) reading device, which is used to read prices.[20] Other input devices include the pen light, the graphic mouse, the joystick used in many video games, specialized kaypads, the touchtone telephone, and the scanner which copies a photo onto the computer. Many years ago, the punched cards were the main device for the data entry.

Storage Hardware

Two types of storage hardware are commonly used :

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[19] David M. Kroenke and Kathleen A. Dolan, pp. 62-63.

[20] Ibid.

Magnetic tapes and magnetic disks. They are called storage devices because they are used primarily to store computer data. Sometimes they are called I/O (Input/Output) devices because data is written on them and read back in.

Magnetic Tape devices read and write data on the tape cartridge. Magnetic Tape is relatively in expensive, it is easy to transport. Its major usage nowadays is for making backup and archival copies. The main disadvantages are : you can read the data only sequentially; if you want to add a new record or delete an old one, you must rewrite the entire tape. For these reasons, magnetic tapes can't be used for every application.[21]

Magnetic disks store data in concentric circles, called tracks. They exit in two forms. Floppy diskettes are used primarily in microcomputer systems. Hard disks are constructed of a stack of 5 to 20 hard recording surfaces mounted on a central spindle. Any data on the disk can be accessed without having to access all of the preceding data.[22]

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[21] David M. Kroenke and Kathleen A. Dolan, p. 64

[22] Ibid. p. 65.

Output Hardware

Although there are many types of output hardware, two devices are most common: terminals and printers. Even though the terminal Keyboard is considered an input device, the terminal's screen can be used as an output device as well. Responses to requests, messages, and reports can be be displayed on the screen.

A second common type of output devices is the printer. Printers can be classified into serial printers, which print one character at a time, line printer , which prints a whole character at a time, full-character printer prints a whole character the way a type writer does. Dot-matrix printer which prints the character as an array of dots.[23] Recently, a new type of printer entered the market which is the Laser printer , a very high speed, quality, and price printer.

Additional output devices are COM (computer output to Microfilm, Voice synthesis, Bar code printer.

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[23] David M. Kroenke and Kathleen A. Dolan,p. 68.

Processing Hardware

The main processing hardware is the central processing unit (CPU). The CPU executes program instructions that cause data to be read, stored, written, or otherwise processed. CPUs have three functional parts: the control unit, (interprets and executes instructions, moving data around main memory and routing data between peripheral devices [I/O devices] and main memory), the arithmetic logic unit, (performs arithmetic and comparison when directed to do so by the control unit), and the main memory (holds programs instructions and data during processing).[24] CPUs are commonly grouped into three classes micro, mini, Mainframe.

Micro computer

Micro computer are generally the cheapest and smallest. Micro computers initially were bought by families for entertainment and education and by small business people. The accessibility of micro computers and the development of inexpensive, high quality software has resulted in an entire field of personal productivity aids, heavily used in business, industry and even government.[25]

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[24] David M. Kroenke and Kathleen A. Dolan, p. 69.

[25] Ibid.

More and more business computer systems incorporate microcomputers: as personnel productivity tools (for word processing and electronic spreadsheets calculations, for instance) as front-end processors to collect data and then process it and transmit it to a mainframe, as display terminals, or in various combinations.

A typical micro computer includes two floppy-disks or one floppy and hard disk drive (20-200 Mb); main memory (256Kb 16Mb); and graphics and communications capabilities. The price of a micro computer is in the range of $1,000-$10,000. depending on the options the buyer selects.

Mini computers

Mini computers are the next group of computers in terms of size, speed, and cost. This type of computers is purchased by vendor or manufacturers rather than by computer stores. Such vendors make greater expertise available in the selection and acquisition of their products. Vendors provide more comprehensive service and they usually stay closer to their customers.[26] A typical

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[26] David M. Kroenke and Kathleen A. Dolan, pp. 72-74.

mini computer has 2 to 32 Mb main memory . Hard disk could reached 2 Gb. The average costs is between $25,000 and $200,000.

Mini computers are usually multiple-user systems. An average-sized mini-computer would be able to serve 30-40 users. "In the next few years, the mini computers class of computers may well disappear. Larger minis are becoming indistinguishable from mainframes and small minis are becoming indistinguishable from micros."[27]

Mainframe computers

The largest, fastest, and most expensive computers are called mainframes. These computers are nearly always purchased from manufacturers. Because of their size and sophistication, mainframe computers are sold with a great deal of support from the vendor.

A mainframe computer typically has 8 to 64Mb main memory. Disk storage capacities may reach 32 Gb. Mainframe costs $500,000 to more $10 million. Mainframes are multiple-user systems that can support up to 500 user.

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[27] David M. Kroenke and Kathleen A. Dolan, pp. 72-74.

Table #2.4*
Summary of
Comparison of micro, mini, mainframe computers

	Micro	Mini	Mainframe
Main Memory (1000 byte)	32-2000	2000-8000	8000-32000
Instruction Speed mill/sec	.2-4	.5-5	5-100
Disk Storage (bytes)	.2-20 mill.	up to 1 billion	up to 20 billion
Cost	$500-15,000	$50,000-250,000	$500,000-10 mill+
Notes	Usually single-user. Minimum vendor support	Single- or multi-user Often sold by vendors	Multi-user Sold by vender Extensive support

* SOURCE : Business Computer Systems (Singapore: McGraw Hill Book Co.,1989), p. 78

2.3.2. Software

Software, the key to the expanded utilization of computer, is a group of instructions that tell the computer hardware what actions to take. It translates to the language of the user and computer operator into that of the

computer and vice versa.[28] Programs and instructions are called "soft" because they are not mechanical devices.[29]

A computer should provide a tool for solving problems quickly in terms of the computer's time as well as that of the user. The hardware should be designed to operate as fact as possible within a given cost. The software should be designed to minimize the amount of wasted computer time and yet provide as flexible as a means of controlling the operation as possible.

In the first generation computers each step task had to be programmed by the programmer. Later, software was developed to ease the programmer's work. Software has become as important as hardware, and in fact more money is being spent on software than on hardware.[30]

Since the world of business is dynamic, the software of a business computer system should also be flexible in accordance to the changing requirements .

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[28] William Gear Computer organization & Programming Tokyo : McGraw Hill International Book Company, 1981), p. 2.

[29] John C. Keegel The Language of Computer Programming in English (NewYork : Regents Publishing Company, Inc., 1976), p.18.

[30] Ibid., pp. 104-105.

"The flexibility of a software includes the ability to meet changing requirements and varying user needs. Areas where flexibility is wanted are data storage , reporting and options, definition of parameters, data input, and output."[31]

It is convenient to classify software according to its function. Thus, the basic categories of software are System programs and applications, Programming languages, Operating Systems, and Software Packages.

System Programs and Applications

Program preparation is separated into two different tasks. "System programmers, often working for manufacturers, prepare the translator programs and these are transmitted to and stored in the computer."[32] The application programer composes the source programs which are translated by the compiler into a machine language program because the CPU can only deal with machine language.

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[31] James A. Senn. p. 585.

[32] Andrew Vazonyi. p 103.

Programming languages

There are many programming language nowadays. A small part of them are the low level languages such as the assembly language. Assembly language has one-to-one relationship to machine language instructions. On the other hand, there are high-level languages which need a compiler to be translated into a machine language. The most popular languages are : BASIC, FORTRAN, COBOL, PASCAL, PL/1, C. Recently data base languages are being used in small businesses such as : Dbase III+, Dbase IV, FOX Pro base, RBase, Clipper, Paradox and others.[33]

Operating System

The operating system provided the interface between the human user and the computer hardware and software. The main functions of the operating system are" I/O control, multiprogramming, communication control, job control, utility support, translation and linkage editing."[34] The operating systems have three major parts job management, task management, and data management. "Job management

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[33] PC Magazine Aug.1990 p. 505.

[34] David M. Kroenke and Kathleen A. Dolan, pp. 104-105.

allocates resource and starts jobs. Task management supervises jobs being executed and allocates the CPU and main memory. Data management provides facilities to create, process, and administer data"[35]. The most popular operating systems are Dos, OS/II, Vos, MV, VS, and UNIX.

Software Packages

Application packages are sets of application programs which are written for users to apply to their own work. These application programs perform data processing tasks in particularly all functions of management, such as accounting, payroll, finance, engineering, inventory control, marketing,manufacturing, mailing activities, property management, project management, and operation research. Application packages are also available, to data processing for specific industries such as banking, constructive, insurance, and supermarkets.[36]

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[35] David M. Kroenke and Kathleen A. Dolan, p. 540.

[36] Ibid., pp. 326-328.

2.3.3. Data

The third component of a business computer system is data. Before a need can be satisfied, all pertinent fact must be gathered. This is a special problem for computer systems because all data must be put into some form the computer can understand before it can be read in the computer. Thus, data is entered by means of a keyboard or any input device.[37]

Computer data can be categorized as hardware. Thus, there is input data that is read into the computer for processing. There is a processing data inside the CPU. There is an output data, or results, that are usually in human-readable form. Finally, there is stored data which is stored onto some store device and saved for later processing.

The difference between data and information should be clarified. "Data is defined as recorded facts or figures. Information is Knowledge derived from data."[38] Thus, data and information are nor the same. Complete and

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[37] David M. Kroenke and Kathleen A. Dolan, p. 39.

[38] Ibid., p. 41.

correct data is essential for the successful operation of a business computer system. Data can be looked from three different view points: data as an organizational resource, data as it is processed by a business computer system, and computer representation of data.

Data as an Organizational Resource

Most of today's profitable companies share a common characteristic : Their decision makers have rapid access to accurate information that enables them to make effective business decisions quickly.A good business decision can be made only with timely access to reliable data. Incomplete, inaccurate, or inaccessible data spells disaster for the organization.[39]

Data in a Business Computer System

Business people have long recognized data as an invaluable resource. In fact, data processing and information systems have ben around much longer than computers. However, the huge volumes of facts in today's business must handle makes computerization a necessity. Computers are capable of dealing with large volumes of data in a short time with a high degree of consistency.[40] Data

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[39] David M. Kroenke and Kathleen A. Dolan, pp. 47-48.

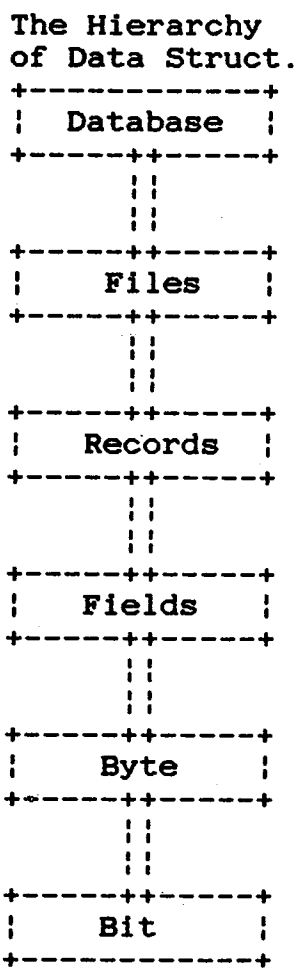
[40] Ibid.

in a business computer system must be gathered, verified, stored, retrieved, and protected.

Computer Representation of Data

As computer data banks are replacing file cabinets and folders , it is relevant to show an idea of how data is organized in the computer.

Data is stored inside the computer in arrangements of bits, each bit being like a switch that can be either the "on" or "off" position. 8-bits are called byte and represent one single character . One or more characters make up a field. A field usually has a logical meaning. It represents an item of data. One or more related fields are known collectively as a record and many related records are stored together in a file.[41] A collection of interrelated files form a database. "A database is a pool of data fundamental to an enterprise



[41] David M. Kroenke and Kathleen A. Dolan, p. 54.

designed to be used by a number of programs"[42].

2.3.4. Procedure

Procedures are instructions for people on the use and operation of the system. Procedures describe how people are to prepare input data, how results are to be used. Procedures also explain what people are to do when errors are created and need to be corrected. Further, procedures explain how people are to operate the computer. They describe what programs to run, what data to use, what to do with the outputs. Procedures must also describe what to do when the computer fails or crashes.[43] Procedures are needed by systems users, operators, and developers. (See Table #2.5).

2.3.5. Personnel

Trained people are the final component of a business computer system. "People bring the other four

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[42] Andrew Vazonyi, p 337.

[43] David M. Kroenke and Kathleen A. Dolan, p. 43.

Table #2.5*
Procedures for Users, Operators, and Developers

Used By	Procedure
Users	How to prepare inputs How to interpret outputs User duties and responsibilities How to correct errors
Operators	Who is authorized to provide inputs What format inputs should have When to run jobs What to do with outputs How to run jobs
Developers	How to determine requirements Standards for system design How to write and test programs How to implement new systems

* SOURCE : Business Computer Systems (Singapore: McGraw Hill Book Co.,1989), p. 87

components together and integrate the computer system into business environment. The major categories of personnel are system development personnel, operations personnel, users, and system clientele."[44]

System Development Personnel

"System development personnel design and produce business computer systems."[45] They may be system analyst, programmers, or data communication analyst. System analyst

[44] David M. Kroenke and Kathleen A. Dolan, p. 54.

[45] Ibid., p. [44].

are those who know both business and computing. Programmers are computer specialists who write programs. These people need not be as good as system analysts in dealing with people, nor do they need to know business as well. Data communication analysts are those whose jobs are to design network, analyze data traffic and data communication software and support evaluation and selection of communication processors.

Operations personnel

Operations personnel run the computer. They need to know "how to start the computer, how to stop it, how to run programs, and how to operate the equipment."[46] When the computer fails, the operations personnel need to know how to minimize the damage and know how to restart the computer.

Users

Users by definition are individuals who interact directly with the computer system. They provide input data and use computer-generated information to do their jobs.

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[46] David M. Kroenke and Kathleen A. Dolan, p. 90.

Clientele

"The clientele of a computer system are people who receive the benefits of the system. They do not directly interact with hardware or software."[47]

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[47] David M. Kroenke and Kathleen A. Dolan, p. 44.

CHAPTER III

RESEARCH METHODOLOGY

The purpose of this chapter is to show what type of data is being collected and the way it is collected, in addition to a notation about the questionnaire.

3.1 Data

3.1.1. Primary data

Since this research is statistical , primary data has to be collected through field work. That is, a representative sample is selected and a visit to each organization of the representative sample is made or a questionnaire is filled by the organization.

Area Covered in the Research

The research covers an area bounded by Al-Awwaly to the north, the south of Al-Ghazieh to the south, and Kafar Jarrah to the east. Thus, the area covered is 13 Km

in length and 9 Km in width. That is,approximately 117 Km^2. Although the area seems to be small but it has its weight economically and culturally.

Determining the Sample

Since the research is statistical , a sample representing the real situation is needed. Organizations have been classified into ten different types.Important that each of these types has different number of organizations. Consequently, the number of organizations in each type will also be different and is determined which is the population, universe of the study, with the coordination of three different organizations. The first is the Chamber of the Industry and Commerce which presents a list of a sample in the Industrial and commercial fields. The next is Alliwa newspaper through its representative journalist in South Lebanon who helps in the selecting the sample of organization in all fields. Finally, Al-Janoub Press which presents a catalog for the researcher about the city of Sidon and its area , Saida 81 and Saida 88. Then, the percentage of each organization type in the universe is determined which leads to a representative sample of 110 organizations.

Table #3.1 and figure #3.1 show the number of each type of the organizations.

Table #3.1
Number of Organizations of the Universe & the Sample

Type	Universe	%	Sample
Agriculture	14	3.8	4
Bank	36	9.7	11
Commercial	117	31.6	35
Contractor	32	8.7	10
Cultural	12	3.5	4
Educational	28	7.6	8
Industrial	64	17.3	19
Medical	21	5.7	6
Services	32	8.7	10
Social Association	13	3.5	4
Total	370	100.0	110

The sample is determined randomly. That is, a table of random numbers is created by a computer program written in the BASIC Language. Each organization in the sample is numbered. Then, the organizations are selected according to the sequence of numbers in the table of the random numbers. Figure #3_2 is a list of the program and Table #3_2 is the table of random numbers.

Fig. #3_1 Contents of the Universe

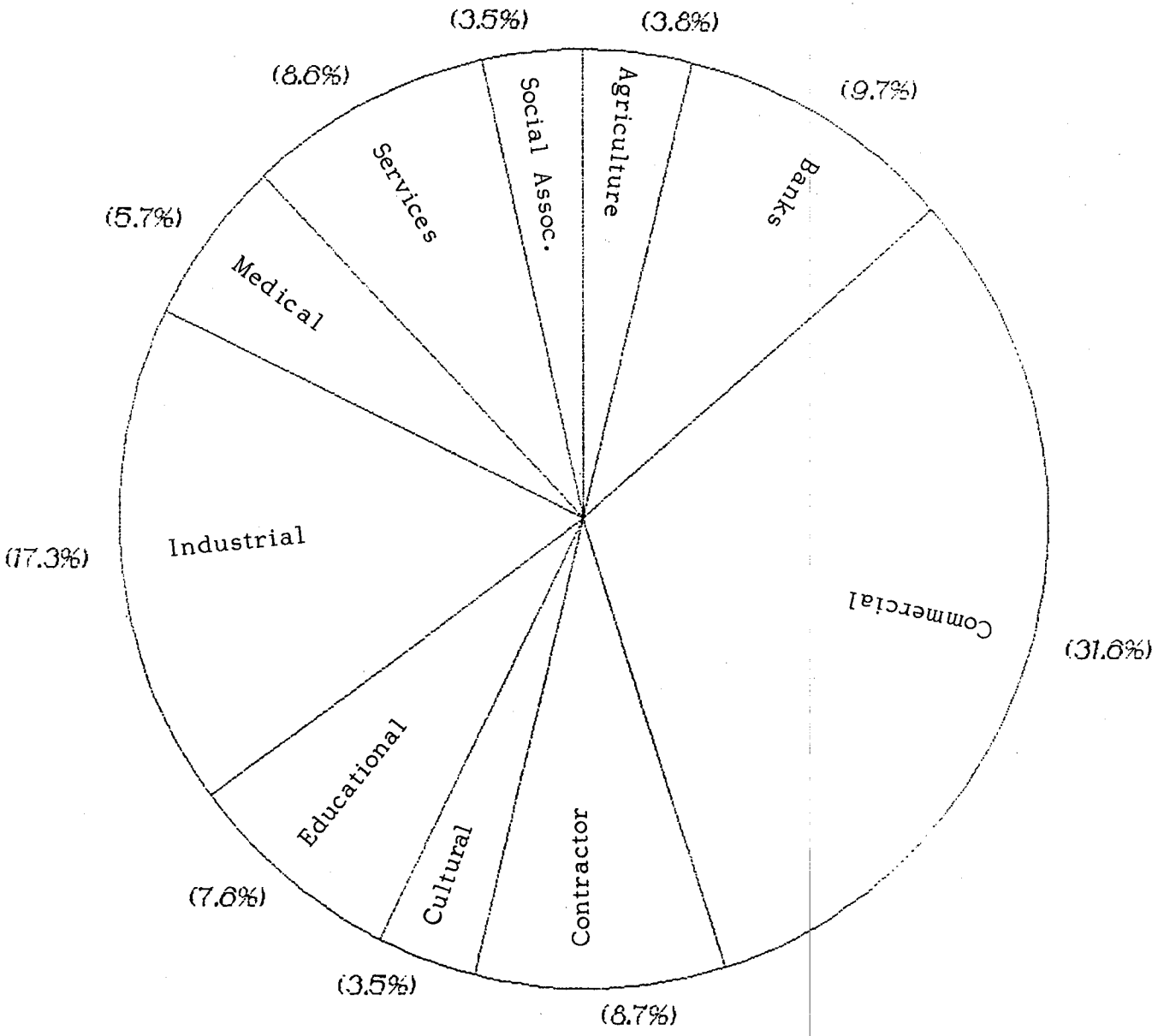


TABLE #3_2

R A N D O M N U M B E R S

1	6	8	7	7	0	4	4	1	9	7	5	9	3	9	9	5	5	6	7	7	6	4	3	1	7
5	4	0	7	5	5	7	6	2	4	1	4	0	3	5	9	2	6	9	3	8	7	9	3	4	4
7	2	2	7	6	7	9	2	5	4	1	4	6	1	3	2	5	8	1	0	0	1	7	5	9	6
5	7	4	1	3	8	9	4	1	8	5	8	1	9	5	6	6	8	3	2	0	3	2	5	1	1
2	5	8	4	1	5	3	4	6	9	3	2	4	8	7	2	4	1	9	8	4	7	5	4	7	8
3	0	4	3	4	6	8	0	6	6	6	7	7	8	2	8	3	8	4	0	3	9	0	7	4	1
1	3	2	0	2	0	0	6	1	5	4	1	3	8	0	3	6	6	9	6	9	8	3	9	1	5
4	5	0	4	4	2	9	9	0	4	6	9	1	4	5	8	5	5	5	8	8	0	2	8	6	6
2	0	0	9	6	8	2	9	9	5	8	3	0	1	3	4	6	4	5	6	9	7	2	6	1	2
0	8	7	9	0	5	9	4	5	0	1	4	3	8	4	9	5	6	4	5	7	7	7	6	0	6
3	7	8	1	6	8	5	0	1	3	6	2	7	9	6	4	7	9	1	1	3	6	5	5	4	4
4	2	7	5	7	6	9	3	8	8	7	8	2	9	7	7	7	4	1	7	2	5	6	7	9	4
1	7	6	3	0	5	8	6	2	2	3	9	8	1	5	4	1	3	9	9	5	4	9	9	8	8
2	5	9	5	1	6	6	1	7	2	5	3	5	6	8	7	7	7	3	5	4	9	5	1	6	1
8	1	4	5	5	2	6	8	8	8	3	5	3	1	7	5	1	3	7	2	3	9	0	4	4	2
9	9	5	4	3	8	6	3	7	9	8	9	3	5	5	1	7	8	9	5	7	5	8	0	0	0
2	1	0	3	4	7	3	2	7	1	7	4	2	5	2	1	5	9	1	0	1	8	7	3	1	3
3	5	8	0	6	9	2	1	6	5	4	4	1	6	8	4	8	1	7	2	4	6	1	4	0	6
7	7	9	8	6	8	7	7	3	9	1	6	0	0	7	5	5	0	7	9	5	2	6	2	2	1
5	4	3	3	8	6	6	1	5	2	0	7	6	5	4	1	7	9	3	9	3	5	9	9	5	9
5	6	9	0	0	5	0	1	7	6	5	1	8	7	0	0	9	3	0	1	3	1	0	5	6	7
1	7	8	7	9	4	3	6	6	7	1	1	4	7	1	5	0	6	6	9	9	3	0	5	7	8
2	6	3	4	7	6	2	5	3	0	2	1	6	2	6	7	8	3	0	8	1	8	2	2	1	2
4	6	0	3	8	9	2	0	1	2	2	4	5	1	5	1	0	8	2	5	9	2	1	8	3	2
3	8	0	3	4	3	1	9	5	8	1	6	4	9	7	7	8	4	8	8	7	8	7	3	6	5
4	5	3	0	6	8	4	3	2	2	7	7	2	9	2	1	4	3	1	8	5	7	0	5	0	9
9	4	5	4	5	3	9	9	4	4	3	2	0	4	9	1	1	8	3	3	7	1	8	2	3	2
0	1	7	6	1	6	4	6	0	9	5	8	3	7	8	7	9	4	8	1	9	3	9	2	8	0
7	8	1	7	2	7	5	5	4	0	0	3	3	9	5	5	4	1	7	1	4	3	7	0	5	6
1	1	2	4	9	7	9	4	2	9	1	8	5	7	7	5	5	3	7	8	4	0	8	2	8	4
5	7	3	8	7	7	5	8	1	1	3	2	8	8	0	2	0	0	4	6	4	3	6	8	8	8
2	3	2	1	5	9	2	6	9	7	1	6	9	6	7	6	1	4	3	1	4	8	0	8	6	9
1	3	2	0	8	4	2	0	5	0	9	0	7	3	9	4	3	2	2	9	4	5	9	9	8	3
4	1	5	9	4	4	5	6	2	4	8	3	9	0	2	8	8	8	1	5	9	7	0	7	3	9
1	4	1	5	1	4	9	2	4	6	4	9	2	2	5	1	0	9	7	0	0	5	0	7	6	7
1	3	8	0	2	9	0	8	1	1	9	5	7	6	0	6	8	2	8	2	0	4	5	7	9	9
6	2	6	9	3	4	1	1	4	1	8	1	4	3	2	5	7	6	7	4	4	4	1	0	0	5
6	7	5	4	1	4	6	0	4	7	5	2	2	8	5	2	9	9	3	3	9	3	2	8	9	1
9	6	8	1	6	3	3	1	2	3	5	2	7	7	2	4	2	6	7	3	6	2	5	6	0	3
6	4	2	9	2	7	4	5	1	3	1	5	8	1	6	2	6	3	4	6	2	3	6	0	2	2
6	1	5	4	5	0	7	6	2	2	5	7	2	9	6	4	1	1	2	8	0	4	8	3	6	5
0	6	9	1	1	4	9	0	7	6	1	9	6	6	9	6	7	2	5	1	6	2	4	3	3	5
6	5	5	1	8	6	7	7	2	4	6	7	4	0	2	5	8	4	7	3	0	1	6	7	4	8

Figure #3_2
List of the BASIC Program of the Random Numbers

```
10 CLS
20 LPRINT ,,"         TABLE #3_2           "
30 LPRINT ,,"R A N D O M    N U M B E R S"
40 LPRINT ,,"============================="
50 FOR I = 1   TO 5
60 LPRINT
70 NEXT I
80 FOR I = 1   TO 78
90 LPRINT "-";
100 NEXT I
110 FOR I = 1   TO 1118
120 V = INT(RND(I)*10)
130 LPRINT V;
140 NEXT I
145 LPRINT "   ";
150 FOR I = 1   TO 78
160 LPRINT "-";
170 NEXT I
180 END
```

How the data is being collected

The data is being collected through a questionnaire. A sample of the questionnaire is in appendix A . The questionnaire is written in English. Many of the persons met are either French educated or of low education , So most of the questionnaires are filled by the researcher through interviews. Before distributing the questionnaire , it was pretested and revised. That is, the questionnaire was

pretested by some organizations and mainly through persons who are working in the computer field. Finally, the questionnaire is revised and reorganized by the coordinator of the Natural Science division at Makassed College for Higher Education (branch of B.U.C. in Sidon), Mr. Labib Kotob.

One hundred and fifty questionnaires were distributed to the organizations. Completed questionnaire were again taken back from only 123 organizations in spite of using the personnel approach in the data collection. The process involved meeting the managers or head of the accounting department, explaining the nature of the study, and then arranging for follow-up visit often few days to clarify any questions and pick up every questionnaire. By the way, few organizations showed resistance to fill the questionnaire items. Thus, the rate of response was 123/150=82%. Since 110 organizations are needed and many organizations are commercial and industrial simultaneously, the sample becomes 101 organization. Again 101 questionnaires are selected randomly out of the 123 questionnaire.

It was intended that this study should help to

explain the methods of how firms have converted from the manual process to the computerized process but after the draft questionnaire has been distributed to some computer specialists in the area of Sidon, they advised the researcher to omit the questions concerning this point. The main reason for this (attitude from the computer staff) is that there is no really consultation phase for designing the software which properly fits the requirements of the organization. Unfortunately, many computer suppliers sell computers in a way similar to selling a television set or a car, and they try to convince the organization that they have made a comprehensive study and defaultly defined the organizations requirements regarding both hardware and software they sold. Thus, there is no proper system study conducted before carrying out the conversion process. Also, most of the organizations prefer not to pay fees for the consultation phase. Moreover, in many organizations there is no special data processing department run by computer specialists. That is, the data processing functions are usually performed by accountants, stockkeepers, or others. These reasons lead to the omission of the assessment of the consulting phase.

Research Variables

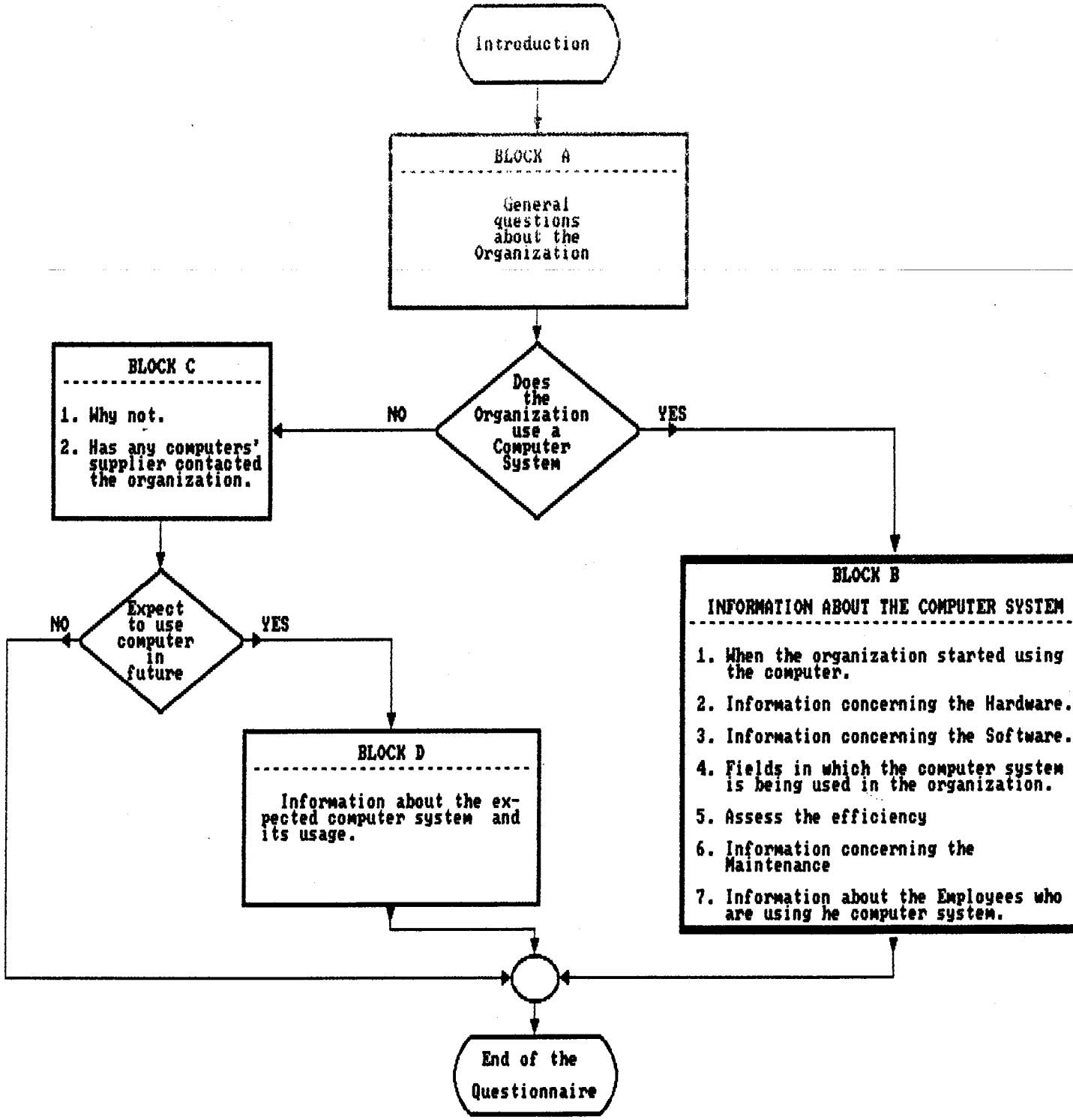
The proposed factors of implementing computer system usage are the age of the firm, its type, its size, and its personnel. These factors are chosen according to expertise people who work in the business computer systems field in the area of Sidon.

The study also covers the assessment of the components of the the business computer systems which are hardware, software, data, procedures, and personnel. In addition, the study draws the attention to the main problems the computer systems in the area of Sidon faces. Moreover, the efficiency of these systems is measured in terms of saving time, manual work, and satisfaction.

Contents of the questionnaire

Figure #3.3 is a chart of the questionnaire (Page 50). The questionnaire consists of 4 main blocks, parts. Block A consists of question #1 to question #6. Block B consists of question #7 to question #30. Block C consists of question #31 to question #33. Block D consists of question #34 to question # 37.

Figure 3.3 : Chart of the Questionnaire



Starting with block A, Question #1 concerns the establishment year of the organization. It is used to determine whether there is any correlation between the age of the organization and the usage of computer systems. As for question #2, it identifies the type of the organization. Obviously, a firm may be dealing with one, two, or more types of business simultaneously. So, one or more answers may be given to this question. Moving to question #3, it gives an idea about the size of the organization. That is, the organization is a branch, that just consists of one unit, a mother firm with branches in Sidon, a mother organization with branches outside Sidon, or a combination of the last two options. Now, question #4, gives the number of employees in the organization . Also this questions gives an idea about the size of the organization. This question and the previous one help the study in finding a correlation between the usage of a computer system and the organization size. Question #5 is a classification of the employees in the organization. This classification is based on the educational level of the employees in the organization. This question helps in showing if there a correlation between the usage of computer systems and the educational level of the employees. The last question of Block A is question #6. It is a filter question . It asks whether a computer system is

being used in the organization or not. It is a filter because each answer leads to a different block of questions. Thus, questions 1 through 6 give a brief background information of the organization.

Block B , which consists of questions #7 through # 30 , is addressed to organizations who have computer systems. The questions can be classified into categories. Questions #7 through #14 concern the hardware of the computer system in the organization. On the other hand, questions #15 to #20 concern the software of the computer system in the organization. Moving to questions #21, it deals with the fields and areas in which the computer system is being used. As for the assess of the efficiency of the computer system in the organization, questions #22 to #24 take care of this point. Questions #25 to #27 concern the maintenance of the computer. Finally, questions #27 to #30 concern the employees who run and use the computer system.

Moving to the assessment of the computer hardware , question #7 asks about the installation year ; while question #8 asks for the year in which the computer system started to run. There is a difference between the year of installation and the year of running because

sometimes it takes more than one year for a computer system to be run. Question #9 is about the trademark of the hardware of the computer system. This question gives an idea about the most used computer hardware that is being used in the area of Sidon. Also still in the hardware questions, question #10 gives the type of hardware of the computer system. That is, is it a micro-computer, a mini-computer, or other types? If there is more than one computer system in the organization , question #11 asks for the availability of the internal communication between them. By the way, the minimum components of the hardware of a computer system are C.P.U., main memory, terminal (Keyboard & Displayed Screen), and auxiliary storage such as floppy diskette or hard disk. On the other hand, question #12 deals with availability of the external communication. This question shows if the technology of modems and computer telecommunication are being used in the area of Sidon. Question #13 gives the components of the hardware of the computer system. The last question concerning the hardware is question #14 which measures the capacity of the hardware of the computer.

Turning to the assessment of the computer software, question #15 is for the operating system of the computer. Question #16 is about the users level of the

computer system: i.e. , is it a single user, multi-user, multi-tasks, or combination of multi-task and multi-user? As for question #17, it is about the type of processing being applied in the organization by the computer system ; is it a batch processing, on-line processing, or combination of the two. Question #18 is about origin of the software which is being used; is it made by the organization's employees or being bought. If it is being bought, it should be determined from where. This part of the answer gives an idea of the software, that is being sold in the area of Sidon, made in Sidon or not. Question #19 is for the type of computer languages that are being used. An organization may use more than one language in its software. This depends on the type of the organization and the fields in which the computer system is being used. Question #20, the last question in the assessment of the software, gives information concerning who run the computer system is it by the organization itself or by a software firm?

Next is question #21. This question tells which fields have been computerized in the organizations in the area of Sidon. That is, in which fields is the computer system being used. More than one answer may be for this question.

Next is the assessment of the efficiency. Question #22 measures how much, in percentage terms, the computer system has saved manual work. While question #23 assesses how much the computer system has sped up the process of the work and saved time. Question #24 indicates the reaction of the management of the organization to the computer system and how much, in percentage terms, are satisfied.

Moving to the Maintenance, question #25 takes care of the auditing after the programs has been run and data been entered. Thus, this question shows how much the data being entered is controlled. Question #26 draws the attention of the main problems that faced the computer system in the organization. In the question the importance of each problem is left to be determined by the person who is in charge of the computer system. Finally, question #27 shows the frequency of maintenance required for the computer system.

The last category of block B is questions concerning the employees who run and use the computer system in the organization. Starting with question #28, it

shows the academic level of the employees who are using the computer system. While question #29 shows their job titles. By the way, employees who are using the computer system as a data entry may be specialized employees or university graduates in majors other than the computer hardware or software. For instance, an accountant employee. Finally, in this block of questions, question #30 states that if the computer system is being used by others than those who regularly uses the computer system.

Moving to the next block, Block C, it is addressed to organizations who do not use computer systems. Starting with question #31, it indicates the reason for not implementing and using computer systems in the organization. Next is question #32 which shows if any computer supplier has contacted the organization and offered a computer system. If the answer is positive, it is required to state the names of three suppliers. From the name of the supplier, it is needed to show whether these supplier are from the area of Sidon or not. Finally, moving to the last question in this block, question #33 shows if the organization expects to use a computer system in the future, or not to use, or undecided. If the answer to

this is No or Undecided, then the questionnaire is finished otherwise, block D should be answered.

Finally, block D is the last block of the questions in the questionnaire. This block is addressed to organizations who do not have computers and expect their process to be computerized in the future. Starting with question #34, it shows when the computer is going to be used in the organization. The following question , question #35, indicates which type of computer hardware the organization is interested in. In this question, there is an option of Undecided because may be the management of the organization does not have a clear idea about the computer hardware. As for question #36, it shows the main fields that are going to be computerized in the organization. Like the previous question, an option of Undecided is available because may be the management does nor have a clear idea or plan in which fields and processes the computer system is going to be used in the organization. Finally, question #37 states if any employee in the organization has at least one course, at any level, in the computer science. The aim of this question is to see whether the existence of the employees who have at least

one computer course helps or increases the possibility of using a computer system in the future.

3.1.2 Secondary Data

As for the Secondary data, the main sources are books, published materials, records of the Chamber of Industry and Commerce, Al-Janoub Press (a media organization). This type of data represents the economic development of the area of Sidon and the importance of the technology of the computer in the data processing.

3.2 Data Analysis

Responses are entered in the computer by the dBase III+ software packages. Then the data was analyzed using the statistical package SPSS (Statistical Package for Social Sciences). Moreover, the graphics are being plotted by the Lotus 123 software package.

Having identified the methodology of this research, it is an important step now to list the findings and the implications of this study. This is in fact the objective of the following chapter.

CHAPTER IV

STUDY FINDINGS

In chapter one, an issue was raised; the issue was: during the 1980s the area of Sidon witnessed a significant development, with respect to other areas in Lebanon, has the technology of computer systems been used and what is the utilization of these systems? In chapter two the business computer system was defined as a combination of hardware, software, data, procedures, and trained personnel.

The aim of this chapter is to answer the question raised in chapter one and give a panorama of the situation of the business computer systems in the area of Sidon in the light of the findings obtained and the interpretation of results.

4.1 Computer Systems Usage in the area of Sidon

As mentioned in chapter III, the study covered most types of the private organization in the area of Sidon. It covered the industrial, agricultural, commercial, banks, contractors, cultural, educational, medical, services, and social associations . The respondent organizations were chosen from all organization types mentioned above . Table #4__1 and Figures from #4_1A to #4_2K give a clear idea about the computer usage in the area of Sidon. Only 44 organizations of 110 use computer systems (40.0%). There are two industrial and commercial organizations who use built-in computers in a special equipment for photography. These equipments have sped up their procedure from days to minutes. Five out of nine (56%) educational organizations are using the computer for teaching. The computer does not cover the administrative services in the educational organizations. Many Educational administrators expect to use computers soon. Few of the 44 organizations have special computer departments. The computer system is just a part of accounting, sales, or stock departments.

Fig4_1A Computer Usage in the Area of Sidon

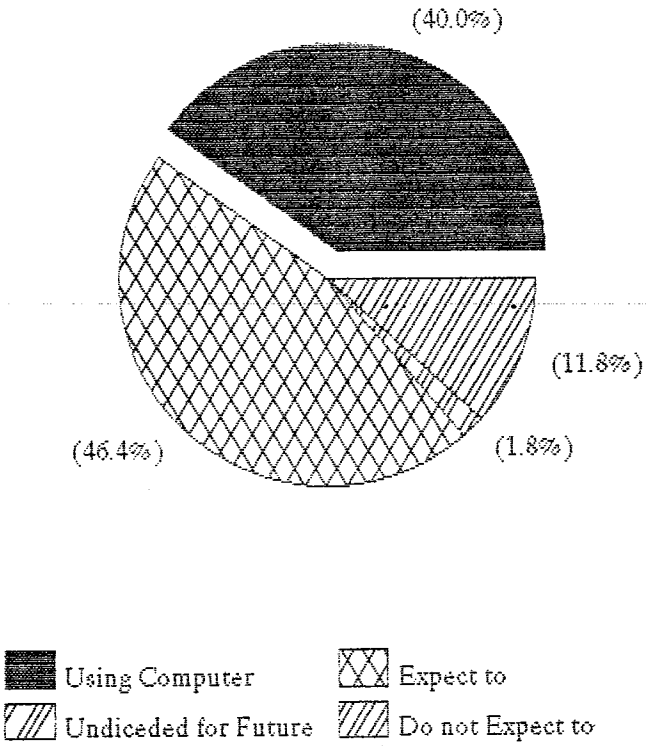
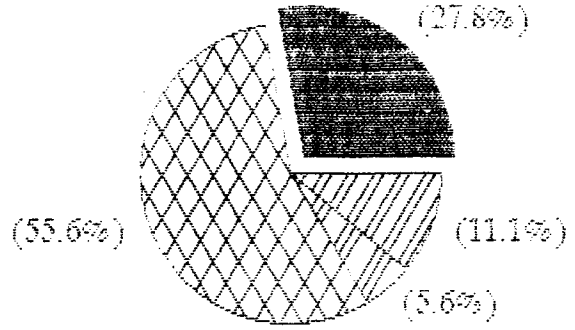


Table 4_1 Computer Usage in the Area of Sidon

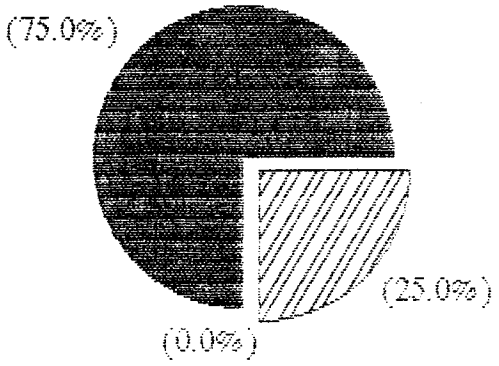
	Using Computer	Expect to use computer in Future			Total
		Yes	Undecided	No	
Industrial	5	10	1	2	18
Agricultural	3	0	0	1	4
Commercial	18	15	0	2	35
Bank	7	2	0	2	11
Contractor	5	4	0	1	10
Educational	0	4	1	3	8
Cultural	1	3	0	0	4
Services	0	8	0	2	10
Medical	2	4	0	0	6
Social Asso.	3	1	0	0	4
Total	44	51	2	13	110

Fig4_1B Computer Usage in the Industrial Organizations



Using Computer
Expect to
Undiceded for Future
Do not Expect to

Fig4_1C Computer Usage in the Agricultural Organizations



Using Computer
Expect to
Undiceded for Future
Do not Expect to

Fig4_1D Computer Usage in the Commercial Organizations

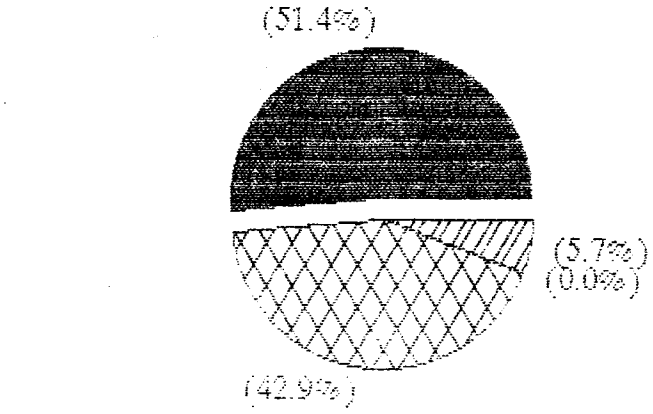


Fig4_1E Computer Usage in the Banks Organizations

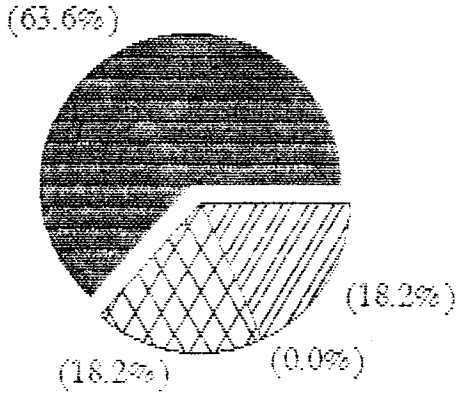


Fig4_1F Computer Usage in the Contractors Organizations

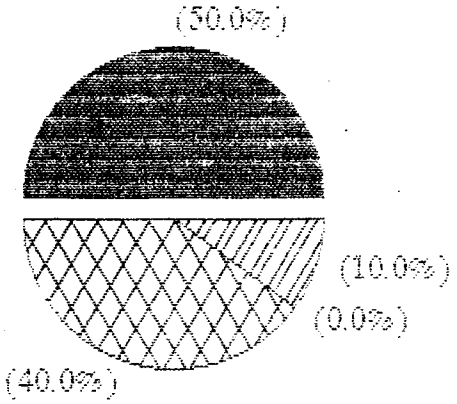


Fig4_1G Computer Usage in the Educational Organizations

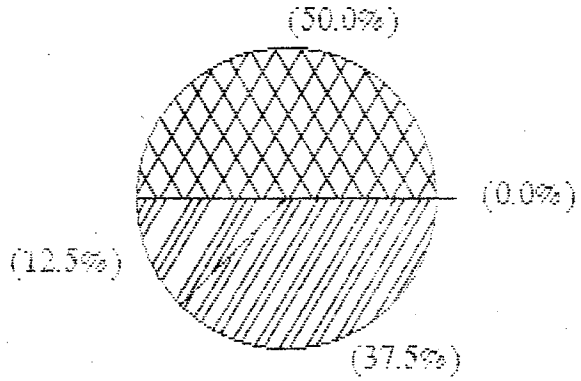


Fig4_1H Computer Usage in the Cultural Organizations

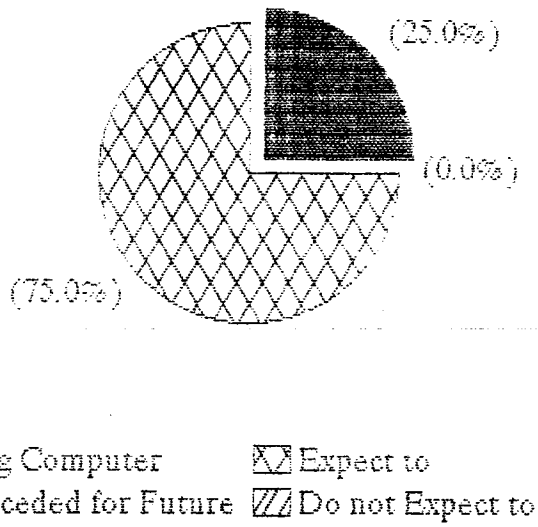


Fig4_1I Computer Usage in the Services Organizations

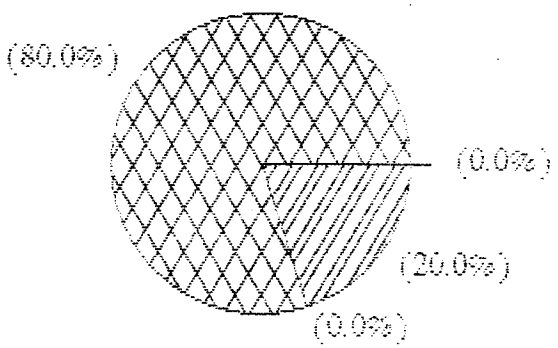


Fig4_1J Computer Usage in the Medical Organizations

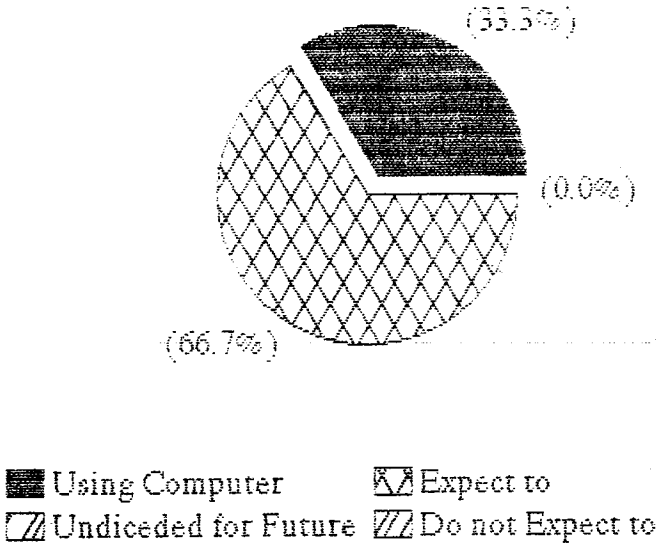
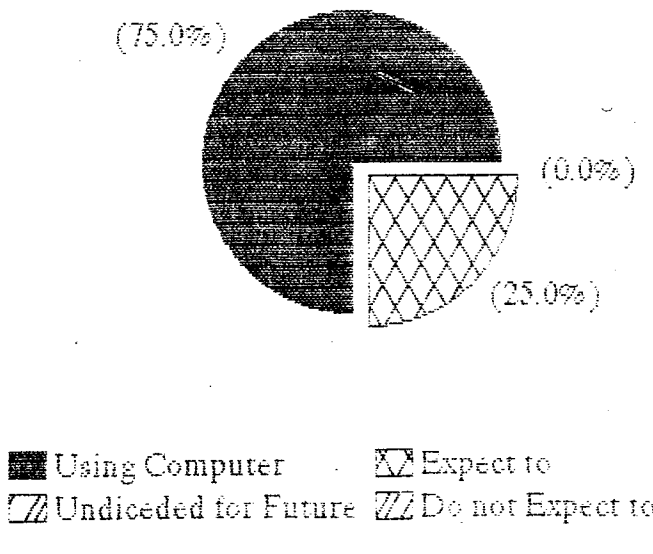


Fig4_1K Computer Usage in the Soical Associations



4.2 Assessment of the components of Business Computer System

In this section we are going to observe in details the components of the business computer system that are being used in the area of Sidon. Thus, our discussion will be on the 44 organizations of the sample respondents who used computer systems and their utilizations . But before going on let us see when the computer systems have been installed and used. Table #4_2A shows the history of the computer systems installation. Table #4_2B shows the history of computer systems usage. **(See figure #4 2).**

The first organizations that installed and used computers were two commercial organizations and a bank. The next organization types in using computer systems were contractor followed by industrial. In the fifth position the social associations come followed by medical and cultural. **(See Table #4_2C)**

Fig.4_2 History of Installing & Using Computers

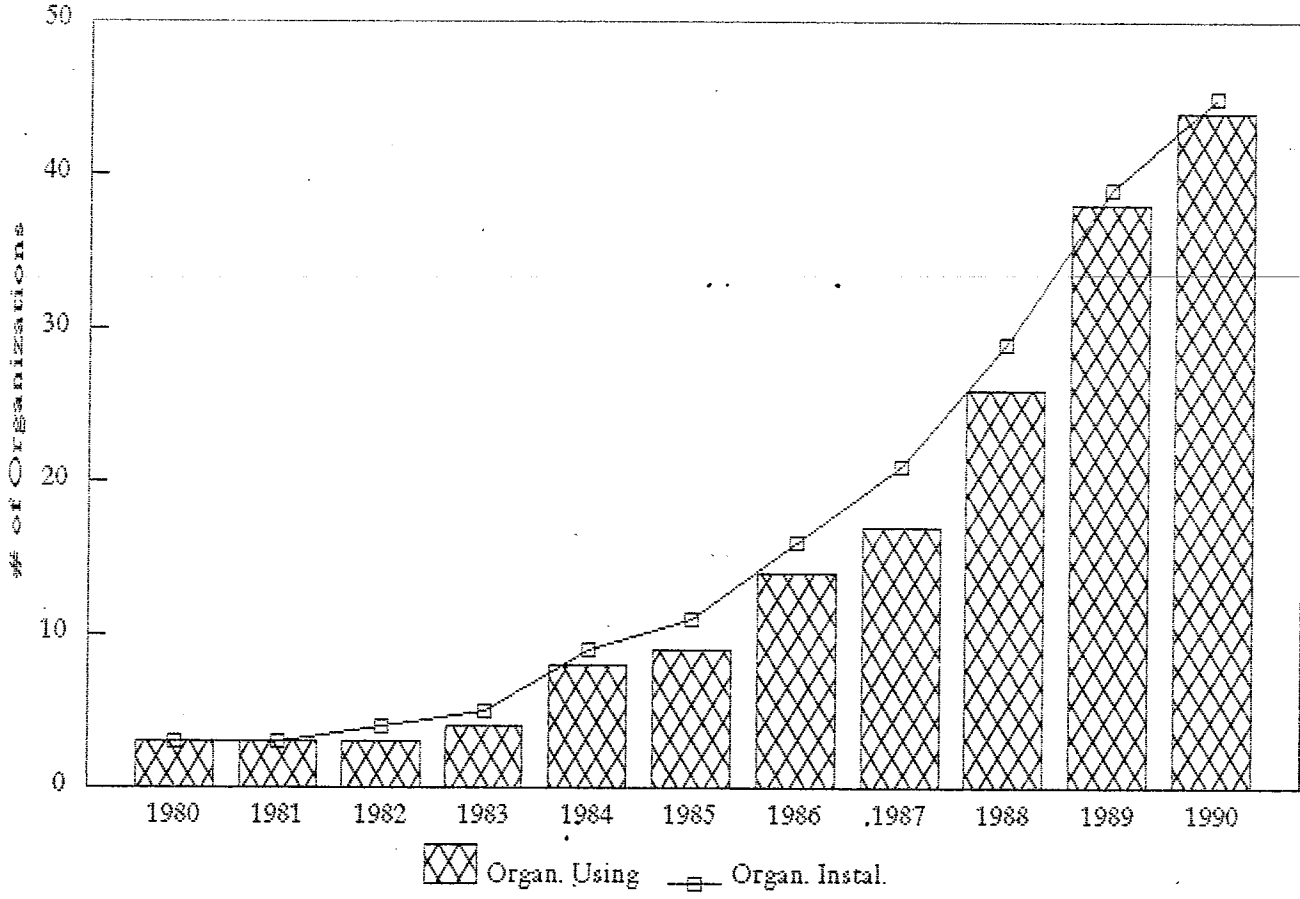


Table 4_2A History of Computer Installtation

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Industrial	0	0	0	1	2	2	3	4	4	4	5
Agricultural	0	0	0	0	0	0	0	1	3	3	3
Commercial	2	2	2	2	3	4	5	6	10	14	18
Bank	1	1	1	1	3	3	4	5	7	7	7
Contractor	0	0	1	1	1	1	2	2	2	6	6
Educational	0	0	0	0	0	0	0	0	0	0	0
Cultural	0	0	0	0	0	0	0	0	0	1	1
Services	0	0	0	0	0	0	0	0	0	0	0
Medical	0	0	0	0	0	0	1	2	2	2	2
Social Asso.	0	0	0	0	0	1	1	1	1	2	3
Total	3	3	4	5	9	11	16	21	29	39	45

##########

Table 4_2B History of Computer Usage

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Industrial	0	0	0	1	2	2	3	3	4	4	5
Agricultural	0	0	0	0	0	0	0	1	2	3	3
Commercial	2	2	2	2	3	3	4	5	9	14	18
Bank	1	1	1	1	3	3	4	5	7	7	7
Contractor	0	0	0	0	0	0	1	1	1	5	5
Educational	0	0	0	0	0	0	0	0	0	0	0
Cultural	0	0	0	0	0	0	0	0	0	1	1
Services	0	0	0	0	0	0	0	0	0	0	0
Medical	0	0	0	0	0	0	1	1	2	2	2
Social Asso.	0	0	0	0	0	1	1	1	1	2	3
Total	3	3	3	4	8	9	14	17	26	38	44

##########

Table 4_2C Organization start Using Computers

Commercial	1980
Bank	1980
Contractor	1982
Industrial	1983
Social Asso.	1985
Medical	1986
Cultural	1989

4.2.1 Hardware

Before dealing with functional components of the computer hardware, let us first have an idea of the trade mark of the computer hardware used in the area of Sidon. Table #4_3 and figure #4_3 give a clear idea of the trademarks of the computer hardware. The most trade mark computer hardware used is BCS. The BCS computer is made in Taiwan. It is a micro computer of PC series. The next trademarks mostly used are IBM and WANG made in U.S.A.

The computer hardware of any business computer may be one of the following PC (Personal Computer), PS (Personal System), minicomputer, or mainframe. Networks are used to make a communication between two or more computers. The networks are commonly used with PCs and PSs. Table #4_4 and figure #4_4 give a clear idea about the hardware type of business computer system used in the area of Sidon. The findings have shown that commercial organizations are the most users of PC and PS (micro computers), while the banks and industrial organization mostly use minicomputers.

Fig 4_3 Trade Mark of the Computer Hardware

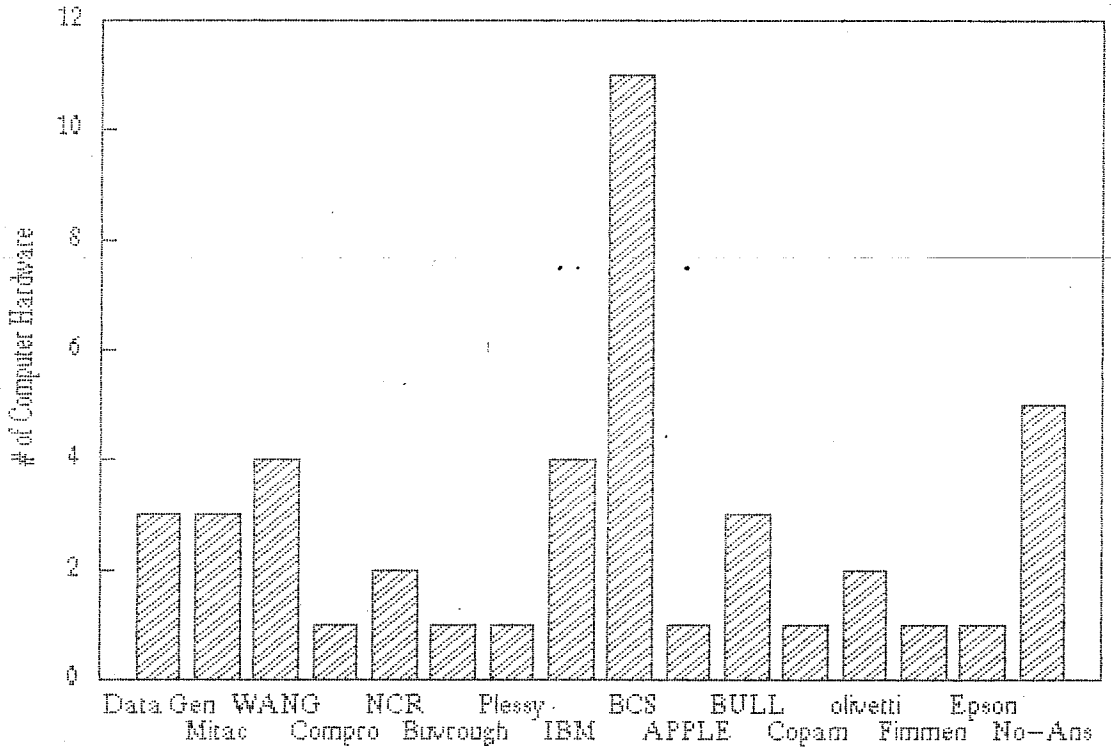


Table 4_3 Trade Mark of the Computer Hardware

Data General	3	BCS	11
Mitac	3	APPLE	1
WANG	4	BULL	3
Compro	1	Copam	1
NCR	2	olivetti	2
Buvroughs	1	Fimmen	1
Plessy	1	Epson	1
IBM	4	No-Answer	5

Fig.4_4 Hardware Types of the Computer Systems

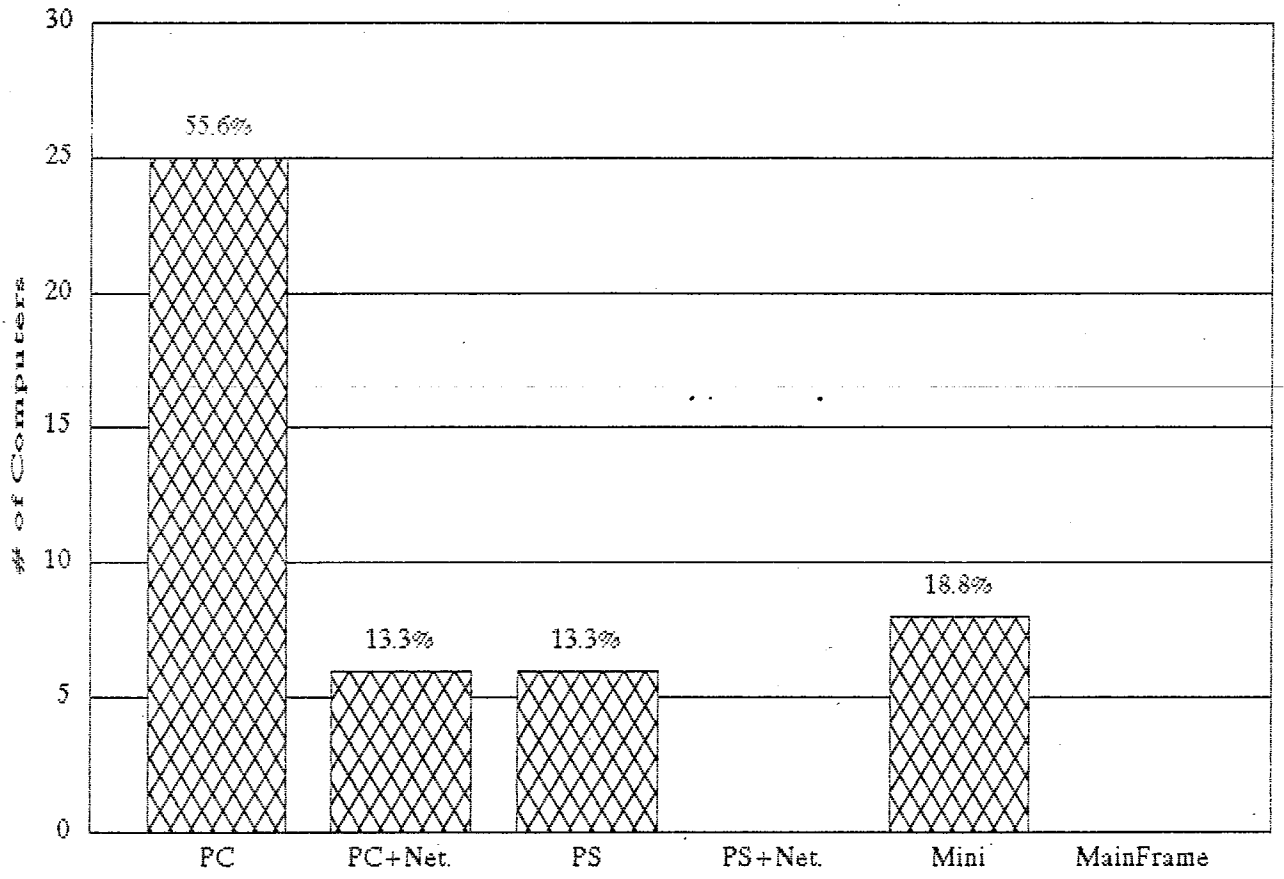


Table 4_4
Hardware of the Computer Systems in the area of Sidon

	PC	PC + Network	PS	PS + Network	Mini-Computer	Mainframe Computer	Communication Inter.	Communication Exter.
Industrial	2	0	1	0	2	0	0	0
Agricultural	1	1	1	0	0	0	1	0
Commercial	12	3	2	0	1	0	2	0
Bank	3	2	0	0	2	0	0	0
Contractor	3	0	1	0	1	0	0	0
Educational	0	0	0	0	0	0	0	0
Cultural	1	0	0	0	1	0	1	0
Services	0	0	0	0	0	0	0	0
Medical	2	0	0	0	0	0	1	0
Social Asso.	1	0	1	0	1	0	0	0
Total	25	6	6	0	8	0	5	0

Table 4_5
Component of the Hardware of the Computer Systems in the area of Sidon

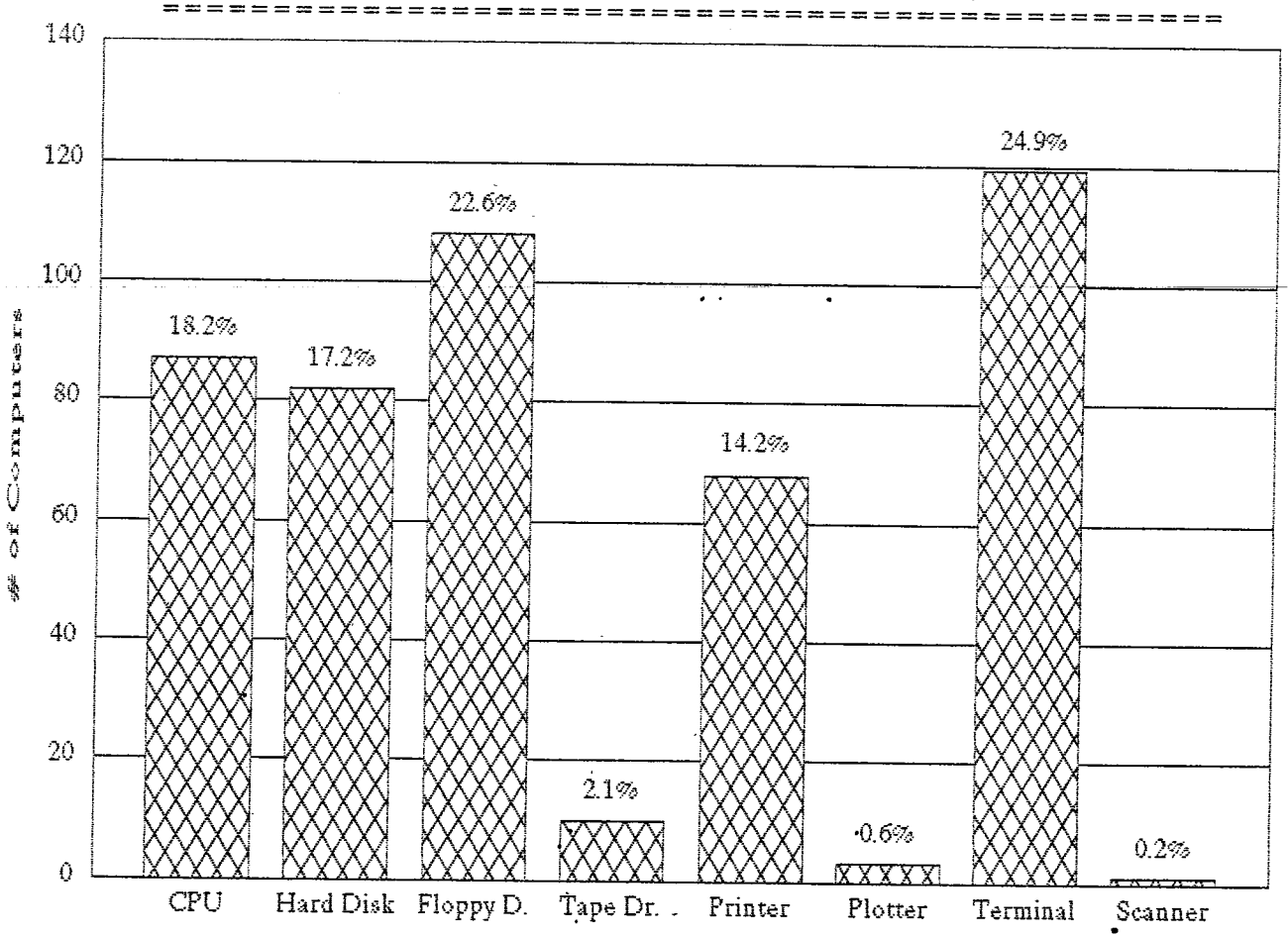
	# of CPU	# of Hard Disk	# of Floppy D.	# of Tape Dr.	# of Printer	# of Plotter	# of Terminal	# of Scanner
Industrial	7	9	10	2	7	0	12	0
Agricultural	4	4	4	0	4	0	4	0
Commercial	22	24	25	4	24	1	23	0
Bank	21	21	22	2	12	0	30	0
Contractor	24	15	34	0	13	2	29	1
Educational	0	0	0	0	0	0	0	0
Cultural	2	2	3	1	2	0	6	0
Services	0	0	0	0	0	0	0	0
Medical	4	4	7	1	1	0	7	0
Social Asso.	3	3	3	0	5	0	8	0
Total	87	82	108	10	68	3	119	1

As for the communication, it is not widely used , only 11% of the respondent organizations use internal communication and no organization uses external communication. This point shows that the advanced technology of the communication in not commonly used is Sidon.

Hardware components may be an input storage, output, and processing . The main hardware devices of the computer systems in the area of Sidon are : CPU (Central Processing Unit and the Main Memory), Hard disk (I/O device), Floppy diskette drive (I/O device), Tape (I/O device), terminal (I/O device), printer (output device), plotter (output device), and scanner (input device). Table #4__5 and Figure #4__5 show the number of each hardware device used. Obviously, the most hardware device used is terminal.

The storage device of the computer systems are : Main memory, Hard disk (fixed), Floppy diskette (removable), and tape. The capacity of the storage devices is measured in Byte. The maximum main memory available in the area of Sidon is 8 Mb. It is the main memory of a mini computer in a cultural organization. The minimum main memory in a microcomputer is 640Kb which is the widely

Fig.4_5 Componets of the Hardware of the Computer Systems



used in Sidon. For more information See Figure #4__6A and Table #4_6. The 640Kb mostly be the main memory for the PC XT microcomputer series.

The maximum hard disk capacity in Sidon is 300 Mb. It is used in cultural, commercial, and social associations. The minimum capacity of a hard disk is 20 Mb, which is most widely used in the area of Sidon. For more details see Table #4_6 and Figure #4_6B.

As for the floppy diskette drives, there are only three different standard capacities : 360Kb, 1.2 Mb, and 1.44 Mb. The 360Kb and 1.2Mb are available on 5.25 inches flexible diskettes . The 1.44Mb is available on 3.5 inches flexible diskette. The most widely floppy drive used is 1.2 Mb and the least used is 1.44Mb. For more details refer to Table 4_6 and Figure 4_6C.

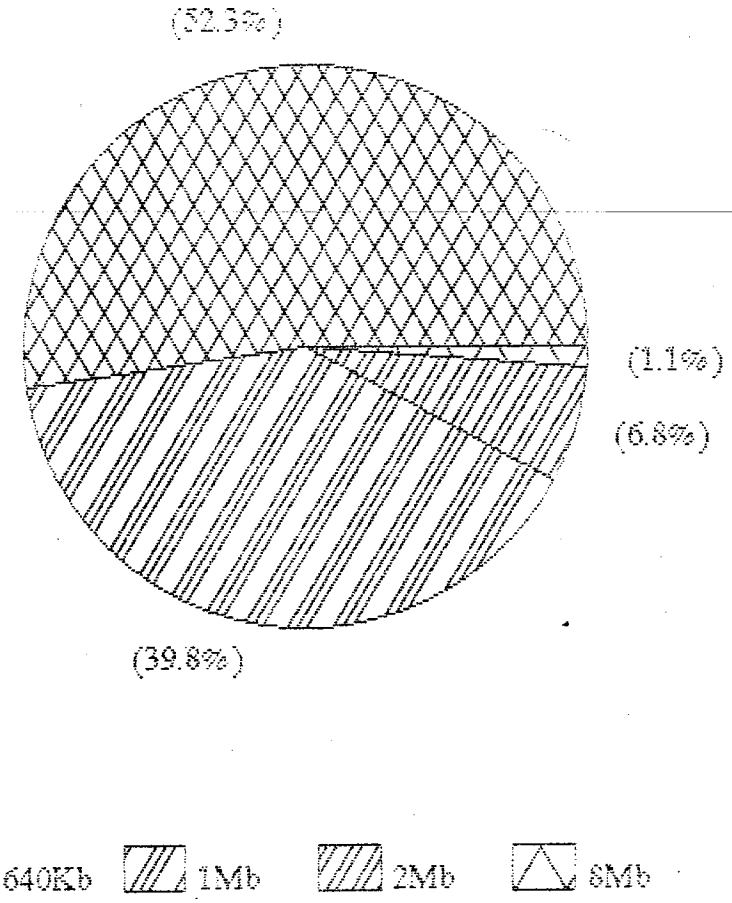
The last storage device in our discussion is the tape drive (cartridge streamer). The capacity of tape drive could be either 20Mb or 60 Mb. The tape drive is not widely used in the area of Sidon. Only 11 organizations use the tape drive out of the 44 organizations (25%). It is important to note that the tape is only used for backups. For more information see Table 4__6 and Figure 4__6D.

Table 4_6

Capacity of the Storage Devices of the Computer Systems in the area of Sidon

	Main Memory					Hard Disk							Floppy Diskette			Tape	
	640Kb	1Mb	2Mb	4Mb	8Mb	20Mb	40Mb	60Mb	120Mb	145Mb	200Mb	300Mb	360Kb	1.2Mb	1.44Mb	20Mb	60Mb
Industrial	6	2	0	0	0	3	2	2	0	2	0	0	5	4	0	0	2
Agricultural	2	2	0	0	0	3	0	1	0	0	0	0	2	1	1	0	0
Commercial	15	5	1	0	0	14	9	0	0	0	1	1	14	9	2	3	0
Bank	7	14	0	0	0	15	2	2	0	2	0	0	7	15	0	0	2
Contractor	12	10	2	0	0	10	12	0	0	1	0	0	11	12	0	1	0
Educational	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cultural	0	1	0	0	1	1	0	0	0	0	0	1	0	2	1	0	1
Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Medical	3	0	2	0	0	3	0	0	0	0	0	0	3	4	0	1	0
Social Asso.	1	1	1	0	0	1	1	0	0	0	0	1	1	1	1	0	1
Total	46	35	6	0	1	50	26	5	0	5	1	3	43	48	5	5	6

Fig.4_6A Main Memory Capacity of the Computer Systems



*** 0.0% 4Mb

Fig.4_6B Hard Disks Capacity of the Computer Systems

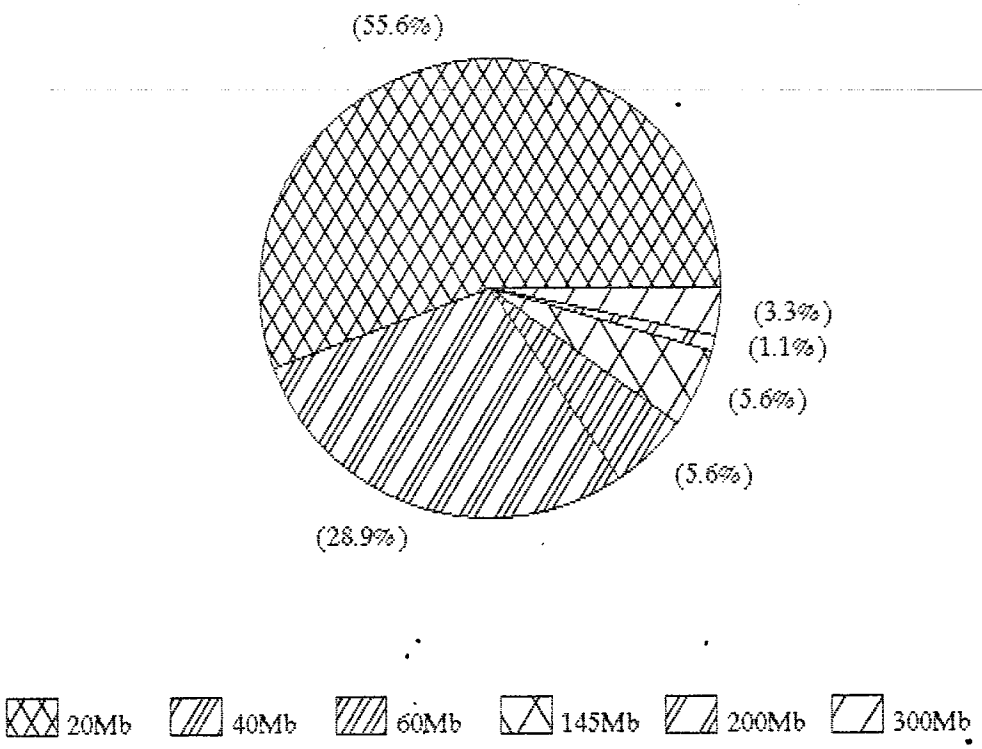


Fig.4_6C Floppy Diskettes Capacity of the Computer Systems

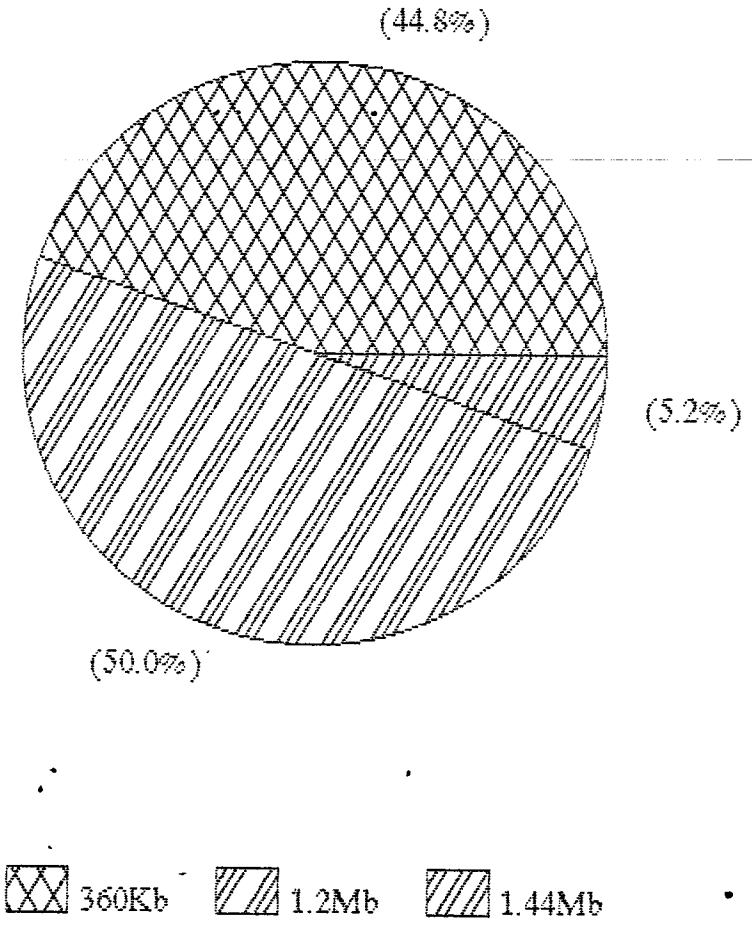
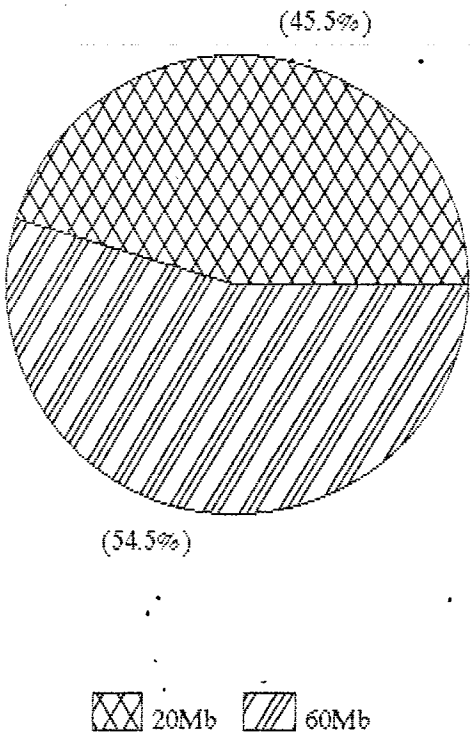


Fig.4_6D Tape Drives Capacity of the Computer Systems



4.2.2 Software

After discussing the findings of the research with respect to the hardware, we move to discuss the findings concerning the software of business computer systems. The middleman between the hardware and the software is the operating system. Thus, the operating system is the first point to deal with.

There are different types of operating systems in the market nowadays. Each minicomputer and mainframe has it own operating system. In the early years of the computer systems, there was also for each microcomputer a special operating system. Nowadays, the Ms-Dos operating system is the operating system for the microcomputers. Ms-Dos is widely used in the area of Sidon. It represented 76% of the operating systems. It is highly used because the majority of the computer systems are microcomputers. **(See Table #4_7 and Figure #4_7).**

Fig.4_7 Operaring Systems of the Computer Systems

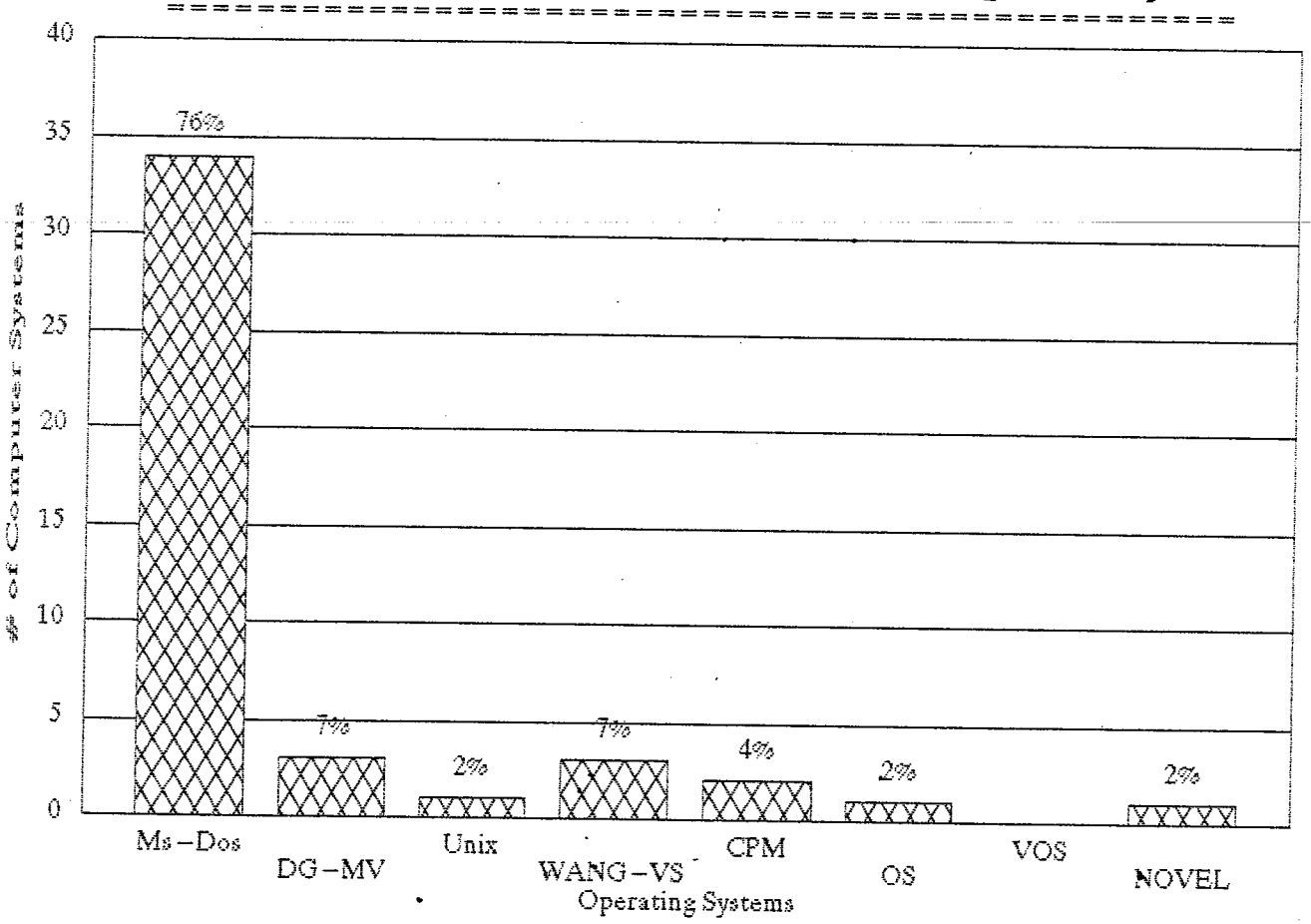


Table 4_7
Operating systems of the Computer Systems in the area of Sidon

	Ms-Dos	DG-MV	Unix	WANG-VS	CPM	OS	VOS	NOVEL
Industrial	3	1	0	1	0	0	0	0
Agricultural	3	0	0	0	0	0	0	0
Commercial	17	1	0	0	0	0	0	0
Bank	4	0	0	1	1	1	0	0
Contractor	4	1	0	0	0	0	0	0
Educational	0	0	0	0	0	0	0	0
Cultural	1	0	1	0	0	0	0	0
Services	0	0	0	0	0	0	0	0
Medical	1	0	0	0	0	0	0	1
Social Asso.	1	0	0	1	1	0	0	0
Total	34	3	1	3	2	1	0	1

Table 4_8
Software source of the Computer Systems in the area of Sidon

	Buy Software	Make	B.Sidon	% of Buy	%of Make	% of B. Sidon
Industrial	5	1	0	83.33	16.67	0.00
Agricultural	3	0	1	100.00	0.00	33.33
Commercial	17	2	10	89.47	10.53	58.82
Bank	4	3	0	57.14	42.86	0.00
Contractor	4	1	2	80.00	20.00	50.00
Educational	0	0	0	****	****	****
Cultural	1	1	0	50.00	50.00	0.00
Services	0	0	1	****	****	****
Medical	1	1	0	50.00	50.00	0.00
Social Asso.	2	1	0	66.67	33.33	0.00
Total	37	10	14			

The source of the software implemented in the area of Sidon is our subject in this paragraph. Some organizations made and developed their own software especially those who have mini computers; others bought a ready made software (package). The findings of the research show 78.7% of the respondent organizations bought packages while the rest (21.3%) developed their own software. Few organizations bought and developed software simultaneously. 37.8% of the software package bought is made or developed is Sidon. Agricultural and commercial organizations have the highest percentages in buying software packages. For more details refer to Table #4_8 and Figures #4_8A and #4_8B.

Any software has to be written in a special form, syntax, or language understood by the computer hardware in order to be implemented. There are many software languages and packages available in the market nowadays. The languages mostly used from the third generation are : Assembly, BASIC, COBOL, and Pascal. The languages from the forth generations are : C language, DataBase systems, and word processor. COBOL is mostly used, 28.8%. It is a normal result since COBOL is by definition a business computer language and easy to be used in a multi-user mode.

Fig.4_8A Source of the Software in the Area of Sidon

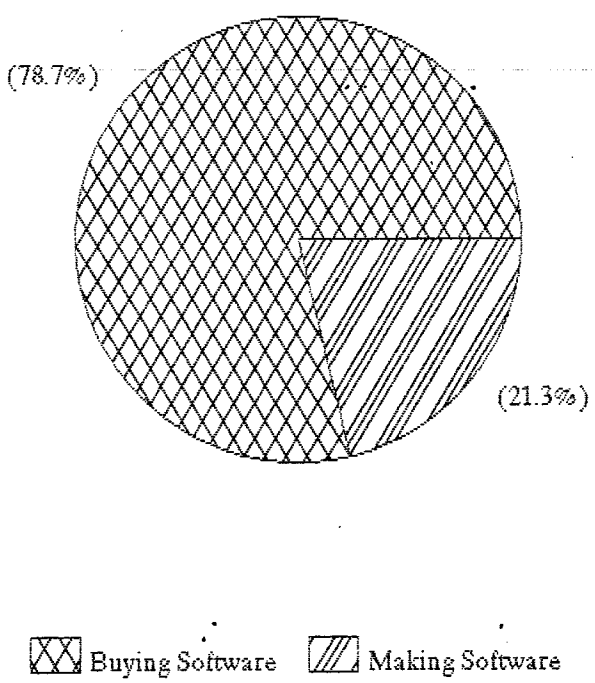
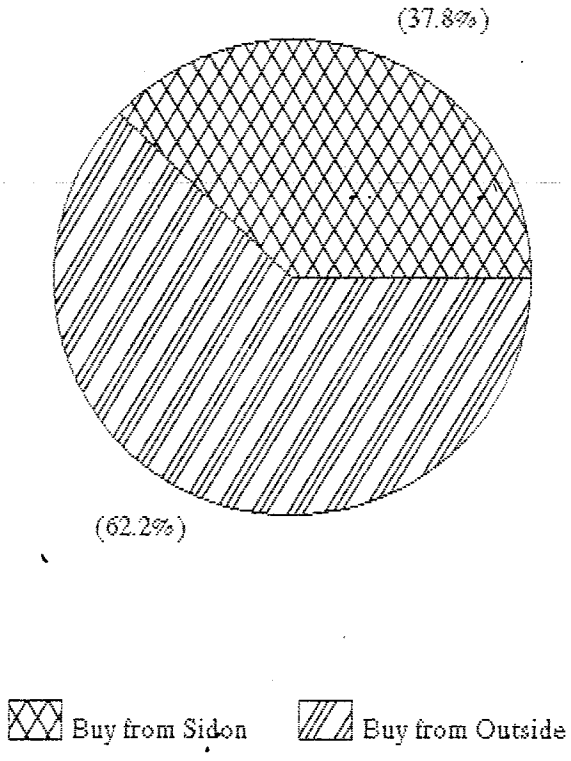


Fig4_8B Source of Bought Software in the Area of Sidon



DBase and Word Processor , new packages, are being used in a small percentage. The next decade will show an increase in their use especially the dbase because the new versions of the DBase languages are so fast and can be used in the multi-user mode. Refer to Figure #4_9 and Table #4_9.

4.2.3 Data

After dealing with hardware and software, data , the third component of a business computer system, is assessed in this section. The study has dealt with the type of data only. It has been found that thirteen types of data applied in the area of Sidon such as: accounting, admission, education, payroll, printing checks, printing special forms, production management, sales, stocks and inventory, exchange, design, archive, and statistics. Accounting is basically used in the computer system; 42 organization of 44 (95%) use accounting data in their computer systems. The second type of data widely applied in the computer systems is stocks and inventory. 32 organizations out of 44 (72%) use the computer system to manage their stocks and inventory. See Table #4_10 and Figure #4_10.

Fig.4_9 Languages of the Software Implemented in the Area of Sidon

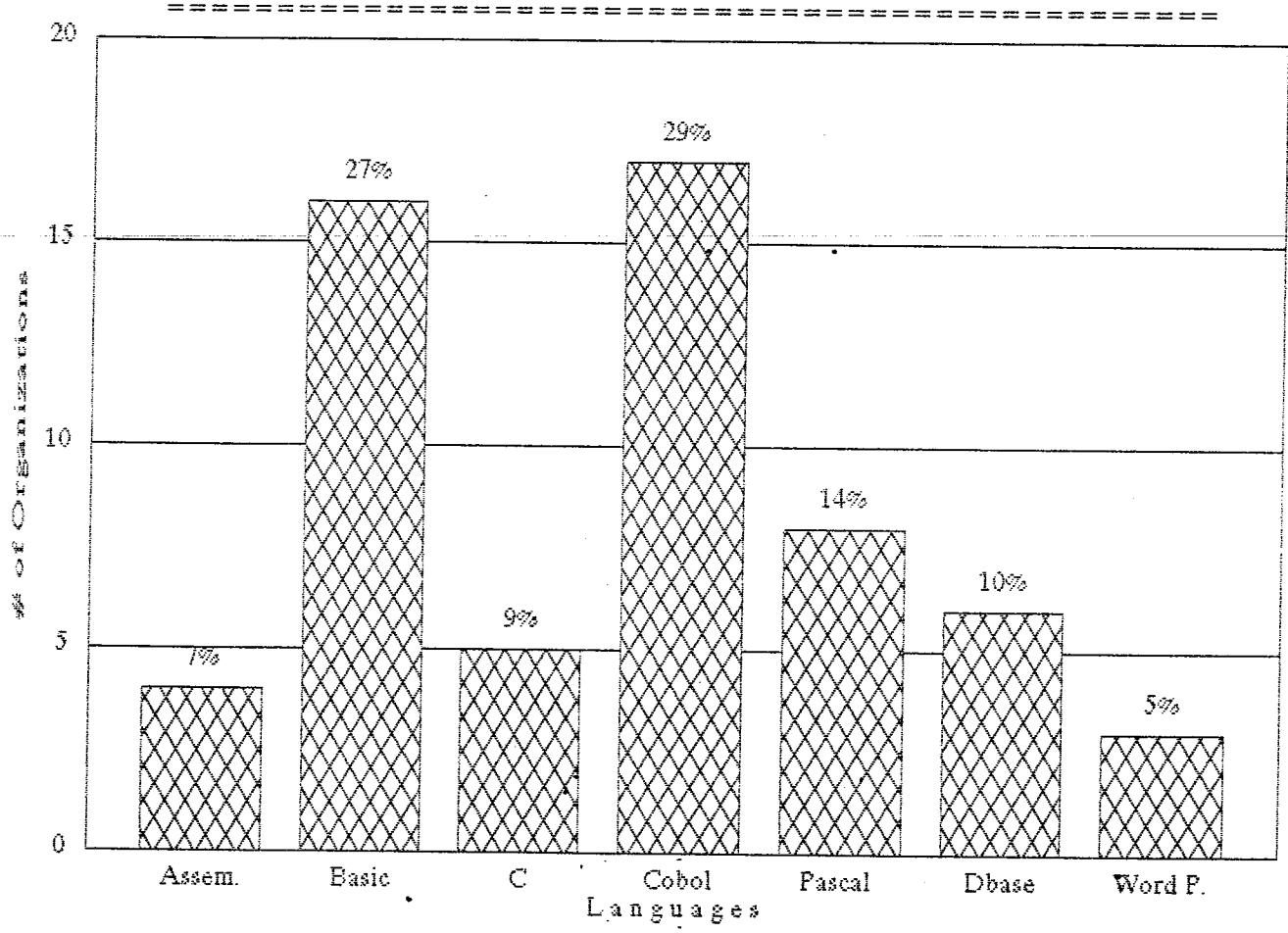


Table 4_9
Languages of the Software of the Computer Systems in the area of Sidon

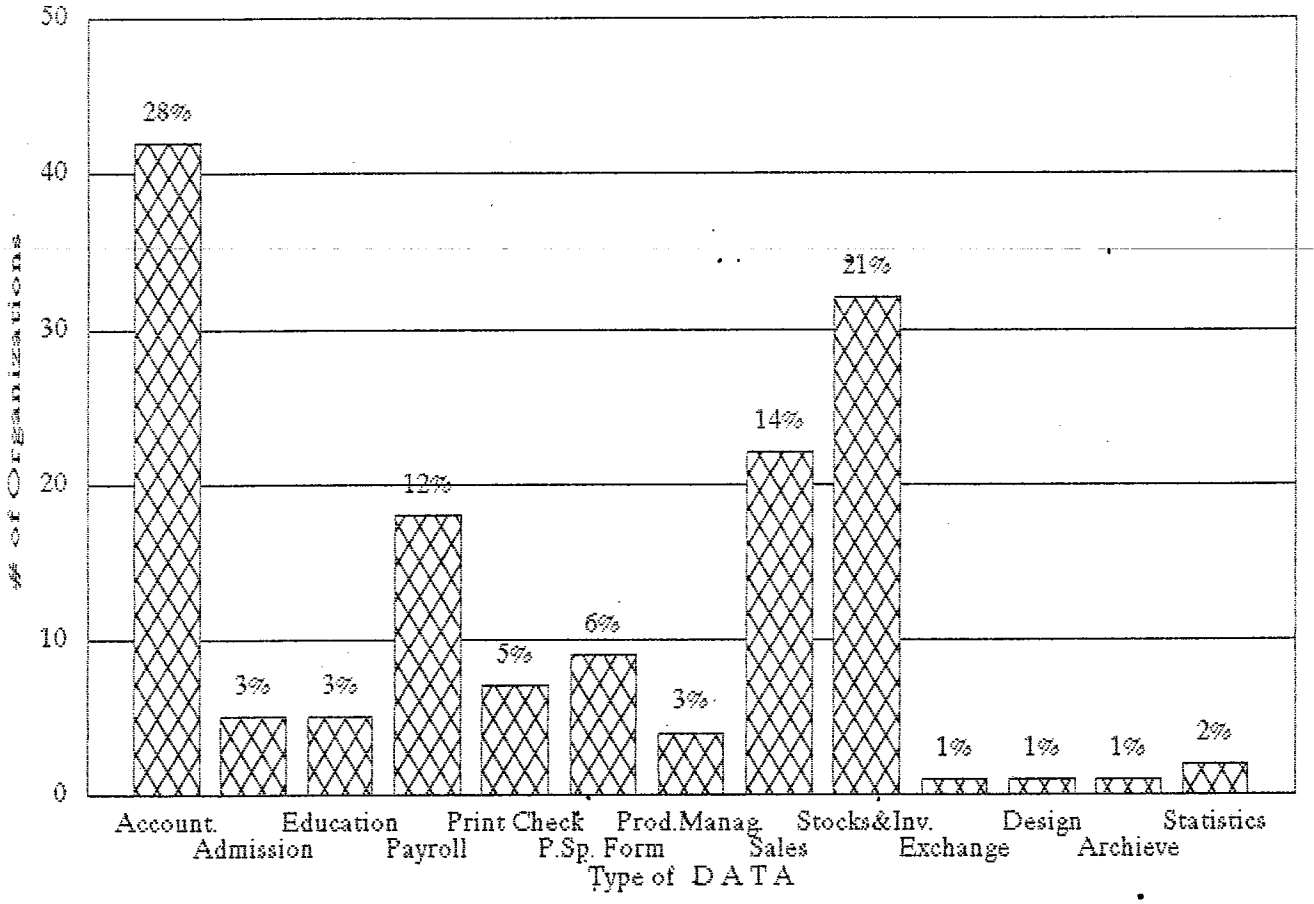
	Assem.	Basic	C	Cobol	Pascal	Dbase	Word P.
Industrial	1	0	2	1	2	1	1
Agricultural	1	0	0	2	0	0	0
Commercial	1	10	0	3	3	1	0
Bank	0	1	0	6	1	1	0
Contractor	0	3	1	1	1	1	0
Educational	0	0	0	0	0	0	0
Cultural	0	0	1	1	1	1	1
Services	0	0	0	0	0	0	0
Medical	0	2	1	1	0	0	0
Social Asso.	1	0	0	2	0	1	1
Total	4	16	5	17	8	6	3

Table 4_10
Type of Data in which the Computer Systems are being used in the area of Sidon

	Accounting	Admission	Education	Payroll	Print Chec	Printing Sp.	Production Form Management
Industrial	5	1	0	2	1	1	2
Agricultural	3	0	0	2	0	0	1
Commercial	18	0	0	6	1	1	0
Bank	7	0	0	0	2	4	0
Contractor	4	0	0	4	1	1	1
Educational	0	0	5	0	0	0	0
Cultural	1	1	0	1	1	0	0
Services	0	0	0	0	0	0	0
Medical	2	1	0	1	0	0	0
Social Asso.	2	2	0	2	1	2	0
Total	42	5	5	18	7	9	4

	Sales	Stock & Inventory	Exchange	Design	Acrchive	Statistics
Industrial	2	5	0	0	0	0
Agricultural	1	3	0	0	0	0
Commercial	16	17	0	0	0	0
Bank	0	0	1	0	0	0
Contractor	2	3	0	1	0	0
Educational	0	0	0	0	0	0
Cultural	0	1	0	0	1	1
Services	0	0	0	0	0	0
Medical	1	2	0	0	0	0
Social Asso.	0	1	0	0	0	1
Total	22	32	1	1	1	2

Fig.4_10 Types of Data used in the Area of Sidon



4.2.4 Procedure

The fourth component of a business computer system is the procedure. The procedure of each organization differs from the other and even within the some categories. This leads to some aspects of the procedure applied in the organizations. For instance, users type mode, data processing methodology, personnel who run the computer systems, and computer auditing.

The user type mode could be single-user, multi-user, or multi-task. The study noted that all the three types are being applied. But the single user mode has showed the highest percentage 46.6%. This shows that the computer systems are only used by one user and run one application at a time. This indicates that 46.6% originations are using the computer systems primitively. See table #4_11 and figure #4_11.

Data can be processed in two different methods either batch processing or on-line processing. When a transaction data is entered into the computer, it does not affect directly the master data files until the transaction

Fig.4_11 Users Mode of the Computer Systems in the Area of Sidon

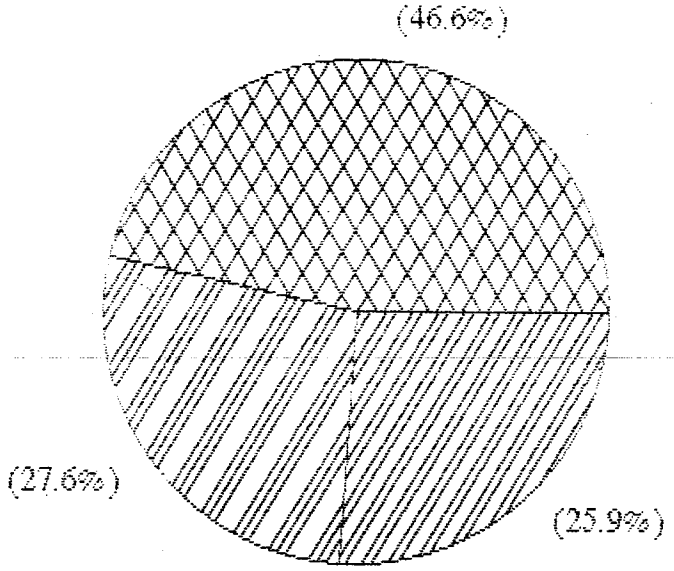


Table 4_11
Users Mode of the Computer Systems in the area of Sidon

	Single User	Multi User	Multi-task
Industrial	3	1	1
Agricultural	2	1	1
Commercial	12	6	5
Bank	3	4	3
Contractor	3	1	2
Educational	0	0	0
Cultural	1	1	1
Services	0	0	0
Medical	1	1	1
Social Asso.	2	1	1
Total	27	16	15

is posted, it is called batch processing. On the other hand, in the on-line system as soon as the transaction is entered and confirmed it will update the master data files. In the first years of computer usage , the batch processing method was widely used. Nowadays, the on-line processing method is widely used. Unfortunately, 54% of the respondent organizations use the batch processing method. Some respondent organization apply the both methods depending on their procedure requirements. Refer to Table #4__12 and Figure #4_12.

The third issue in the procedure analysis is who runs the computer systems in the area of Sidon. Very few organizations do not run their own computer systems. Thus 95.3% of the respondent organizations run their own computer systems and the rest run their computer systems by software companies. This point shows that most of the respondent organizations rely on their own employees in the their computer systems.**(See Figure #4_13 and Table #4_13)**

The forth issue is computer auditing. The main point of this issue has the data after being entered in the computer being audited. Some of the respondent organizations audit the data one, twice, periodically, or

Fig.4_12 Data Process Method of the Computer Systems in the Area of Sidon

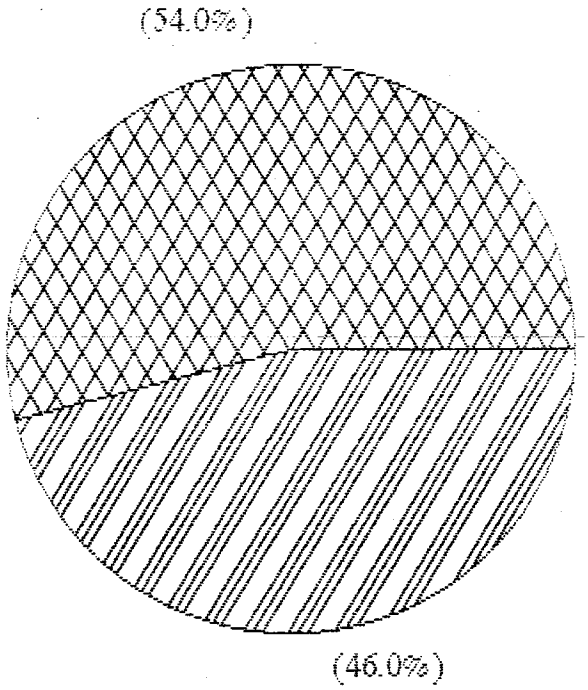


Table 4_12
Process Type of the Computer Systems in the area of Sidon

	Batch	On-Line
Industrial	4	2
Agricultural	3	0
Commercial	13	10
Bank	4	4
Contractor	1	3
Educational	0	0
Cultural	0	1
Services	0	0
Medical	1	1
Social Asso.	1	2
Total	27	23

Fig.4_13 Who run the Computer System in the Area of Sidon

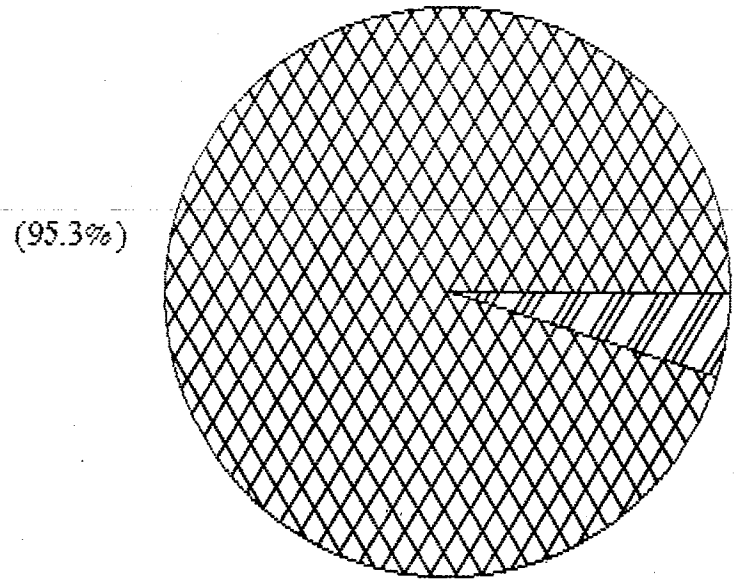


Table 4_13
Running the Computer Systems in the area of Sidon by

	Own Employees	Software Company
Industrial	5	0
Agricultural	3	0
Commercial	17	1
Bank	6	1
Contractor	4	0
Educational	0	0
Cultural	1	0
Services	0	0
Medical	2	0
Social Asso.	3	0
Total	41	2

none at all. 70% of the respondent organizations audit their data. for more details refer to Table #4__14 and figure #4 14.

4.2.5 Personnel

Basically, a computer hardware, ready software, clear data, and procedure can not be run without people. Definitely, a well qualified personnel is required in order to run the computer system efficiently. This study highlights the educational level and job description of the personnel components of the business computer system.

As for the educational level any computer employee has at least one of the following degrees: B.T., T.S.,B.A./B.S., M.S., or PhD. The major computer personnel are B.A./B.S. degree holders. They form 53% of the computer personnel in the area of Sidon. The B.T. holders are 36%. Unfortunately no one has a Ph.D. For more details refer to Table #4_15 and Figure #4_15.

As for the job description, 59% of the employees are operators. Thus, the end user of the computer systems controllers and operators forming 77% of the computer

Fig.4_14 Auditig frequency of the Computer System in the Area of Sidon

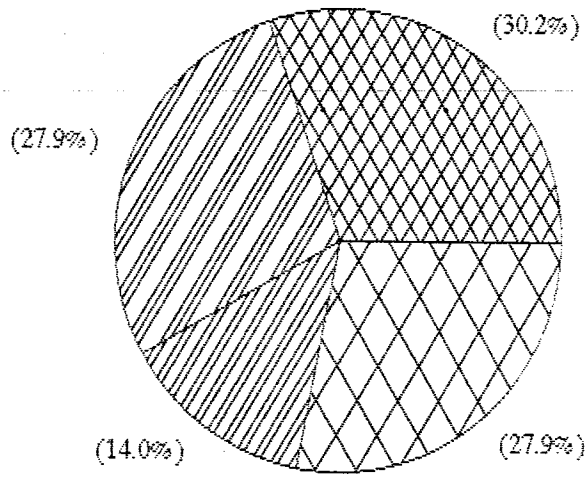


Table 4_14
Auditing Frequency of the Computer Systems in the area of Sidon

	None	Once	Twice	Periodic
Industrial	2	1	0	2
Agricultural	1	0	0	2
Commercial	2	6	4	6
Bank	3	2	1	1
Contractor	3	1	0	0
Educational	0	0	0	0
Cultural	0	0	0	1
Services	0	0	0	0
Medical	1	1	0	0
Social Asso.	1	1	1	0
Total	13	12	6	12

Fig 4_15 Educational Level of the Personnel running the Computer Systems

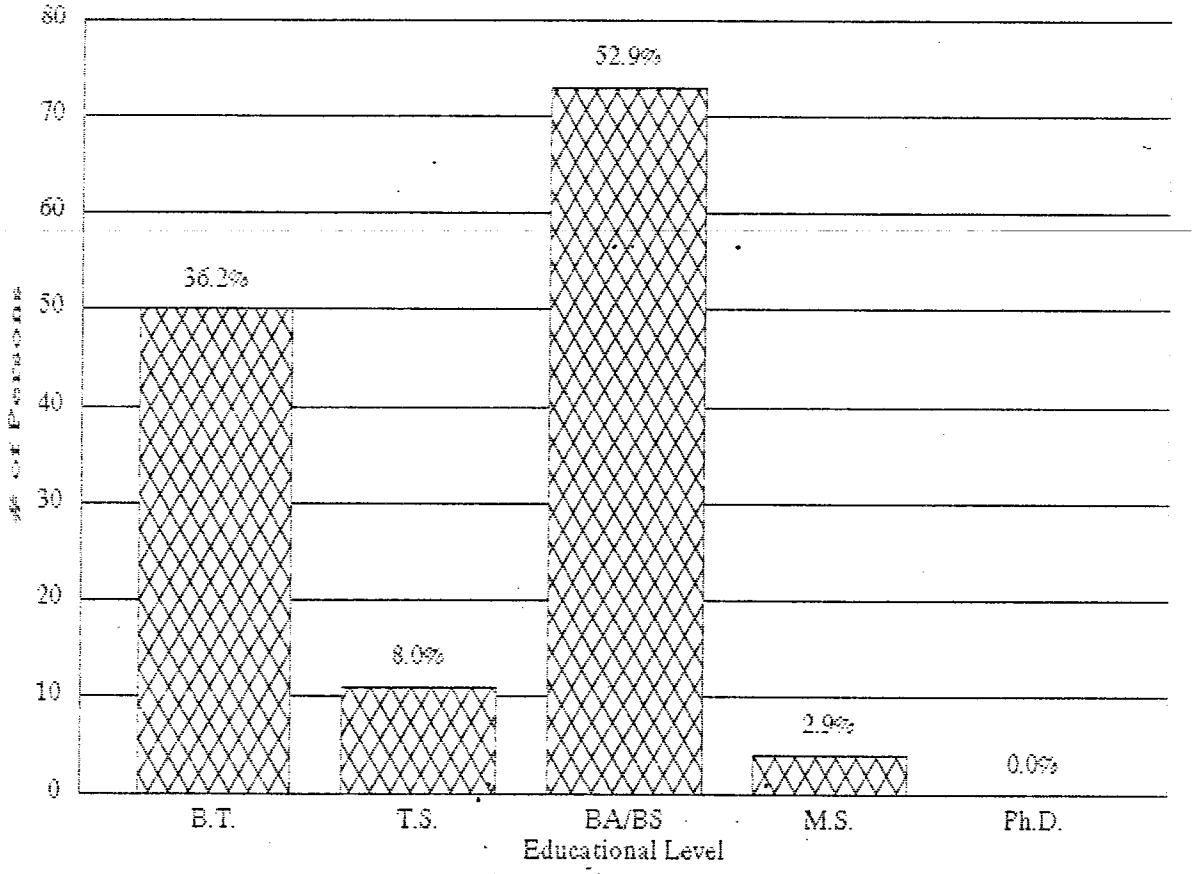


Table 4_15
Educational Level of the Personnel of the Computer Systems in the area of Si

	B.T.	T.S.	BA/BS	M.S.	Ph.D.
Industrial	5	2	5	0	0
Agricultural	1	1	6	1	0
Commercial	9	5	19	1	0
Bank	15	1	27	0	0
Contractor	7	1	8	1	0
Educational	0	0	0	0	0
Cultural	0	0	3	1	0
Services	0	0	0	0	0
Medical	10	0	1	0	0
Social Asso.	3	1	4	0	0
Total	50	11	73	4	0

Table 4_16
Job Description of the Personnel running the Computer Systems in the area of Si

	Controller	Operator	EDP Sup.	Programmer	Sys.Analyst
Industrial	1	9	2	1	0
Agricultural	2	6	1	0	0
Commercial	9	23	1	0	1
Bank	7	25	13	3	0
Contractor	1	14	2	0	0
Educational	0	0	0	0	0
Cultural	0	0	1	3	1
Services	0	0	0	0	0
Medical	3	7	1	1	1
Social Asso.	4	4	0	0	0
Total	27	88	21	10	3

Table 4_17
Other Employees use the Computer Systems

	Yes	No
Industrial	2	3
Agricultural	1	2
Commercial	4	14
Bank	6	1
Contractor	2	3
Educational	0	0
Cultural	1	0
Services	0	0
Medical	1	1
Social Asso.	1	2
Total	18	26

personnel of the respondent organizations. The developers are only 23%. For more details refer to Table #4_16 and Figure #4_16.

Before leaving the personnel subject, let us have an idea about the non computer personnel. Figure #4_17 and Table #4_17 give a clear idea of whether the non computer personnel use the computer or not. Only 41% of the non computer personnel of the respondent organization can use the computer systems.

4.3 Problems of the Computer System

The major problems of any software may be from the hardware, software, or personnel. The hardware problems may be either poor suppliers' maintenance or hardware failure. The main software problem is when the software is unsuitable to the organization procedures. The personnel problem could be unskillful EDP employees. According to the results of the research, the major problem was poor suppliers' maintenance. The next major problem was unsatisfactory effects of the software performance. For more details refer to Table 4_18 and Figure 4_18.

Fig 4_16 Job Description of the Personnel running the Computer Systems

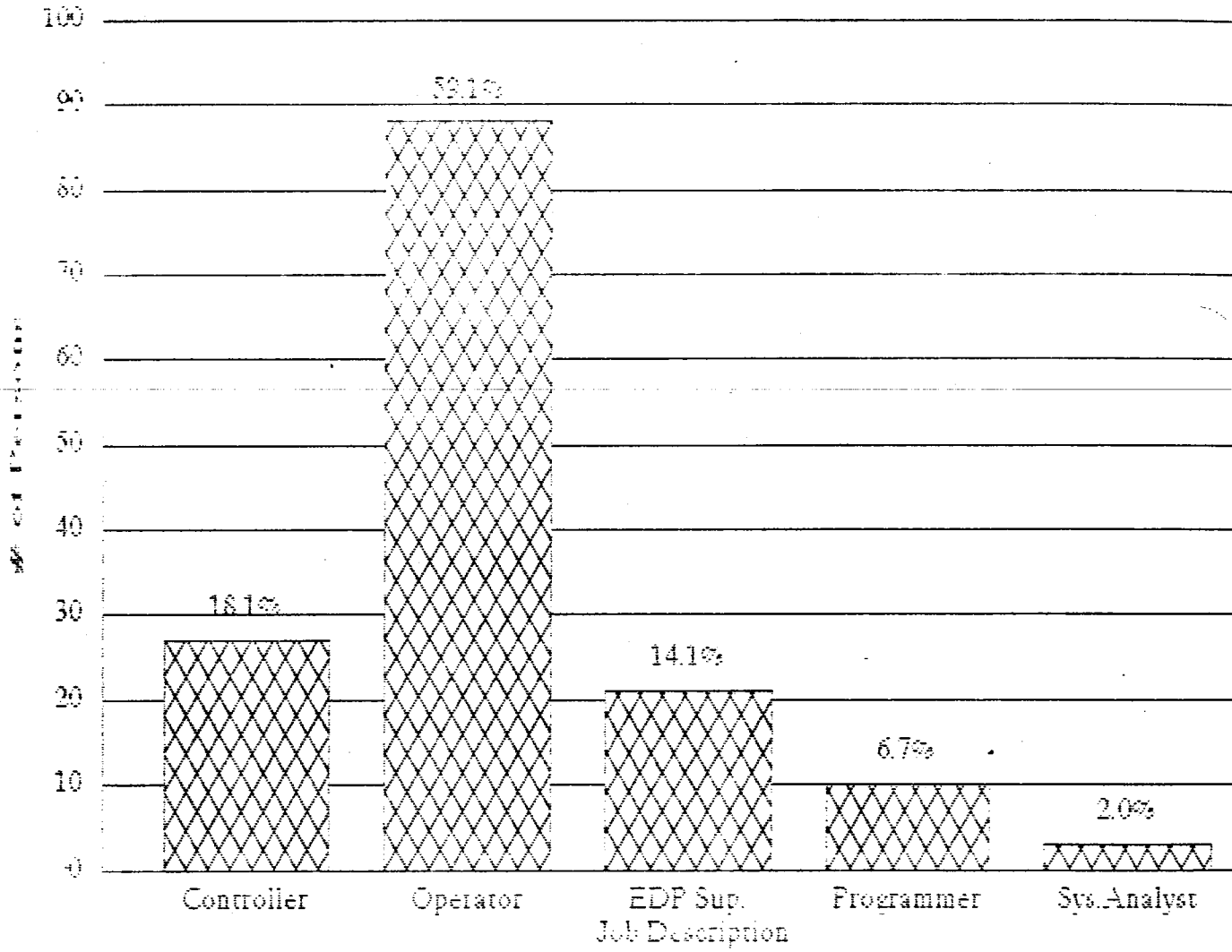


Fig 4_17 Other Employees Use the Computer systems

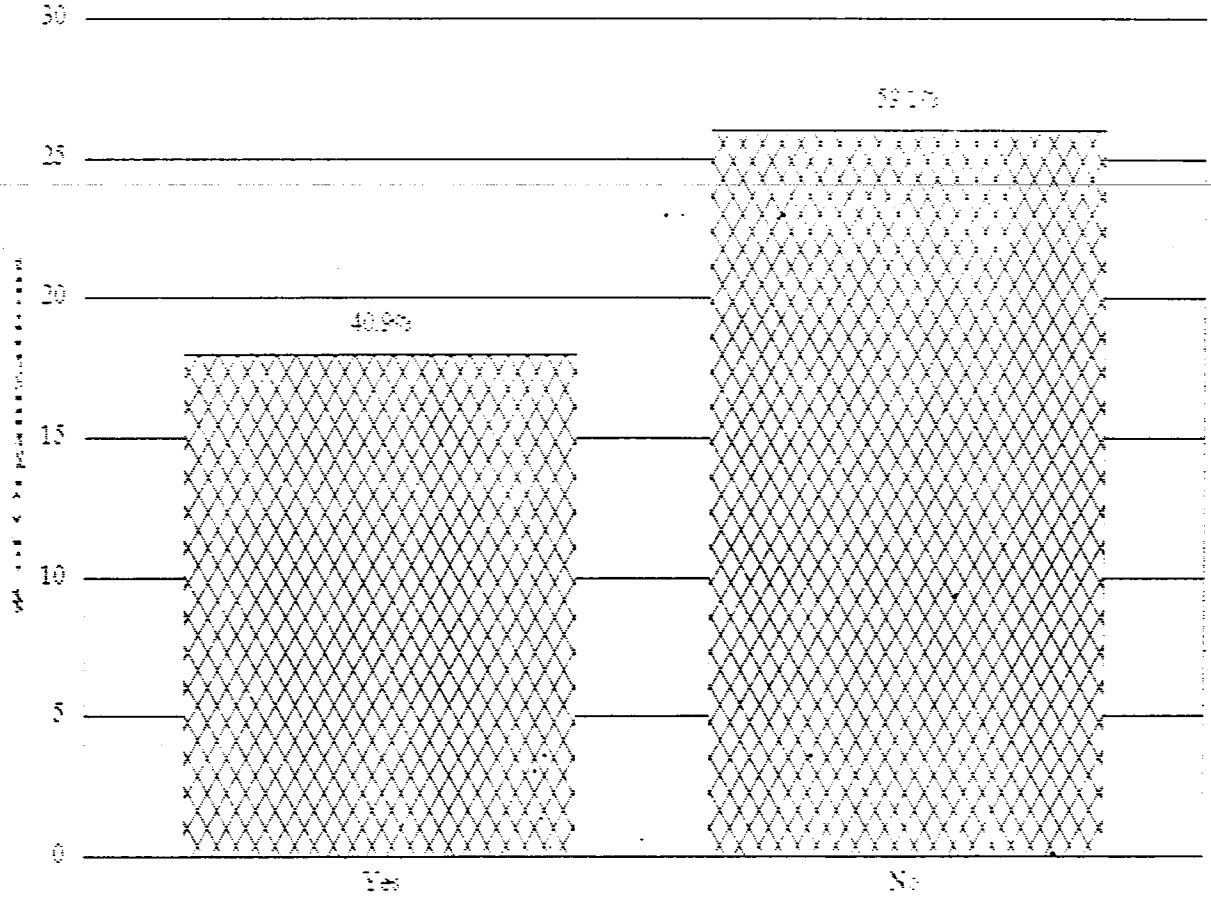


Fig 4_18 Main Prbloms of the Computer systems in the area of Sidon

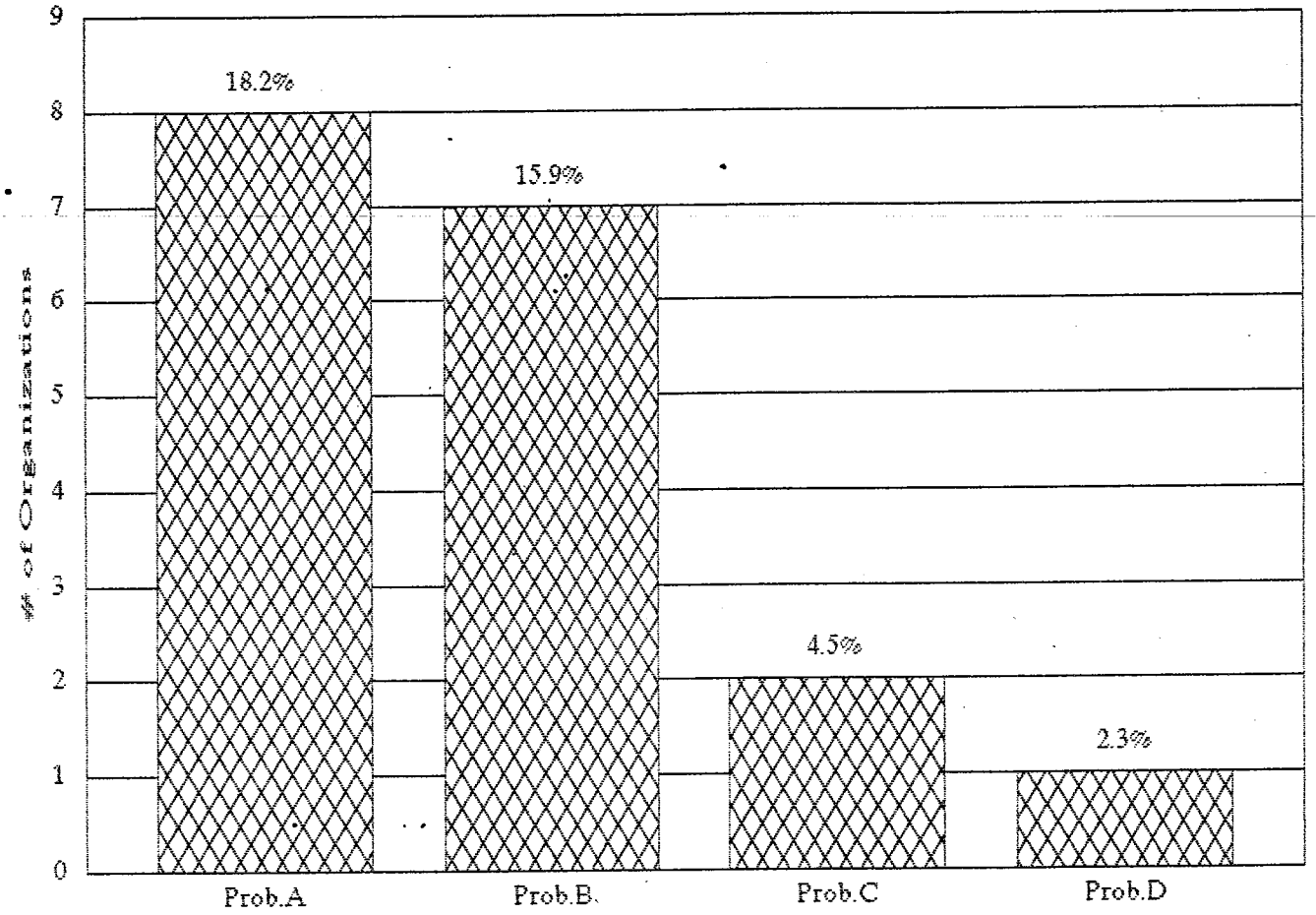


Table 4_18
Main Problems of the Computer Systems in the Area Of Sidon

	Prob.A	Prob.B	Prob.C	Prob.D
Industrial	0	1	1	0
Agricultural	0	1	0	0
Commercial	1	5	0	0
Bank	6	0	1	0
Contractor	1	0	0	0
Educational	0	0	0	0
Cultural	0	0	0	0
Services	0	0	0	0
Medical	0	0	0	0
Social Asso.	0	0	0	1
Total	8	7	2	1

Prob.A : Poor suppliers' maintenance
Prob.B : Unsatisfying software performance
Prob.C : Hardware Failure
Prob.D : Lack of skillful EDP employee

Table 4_19
Frequency of Maintenance of the Computer Systems

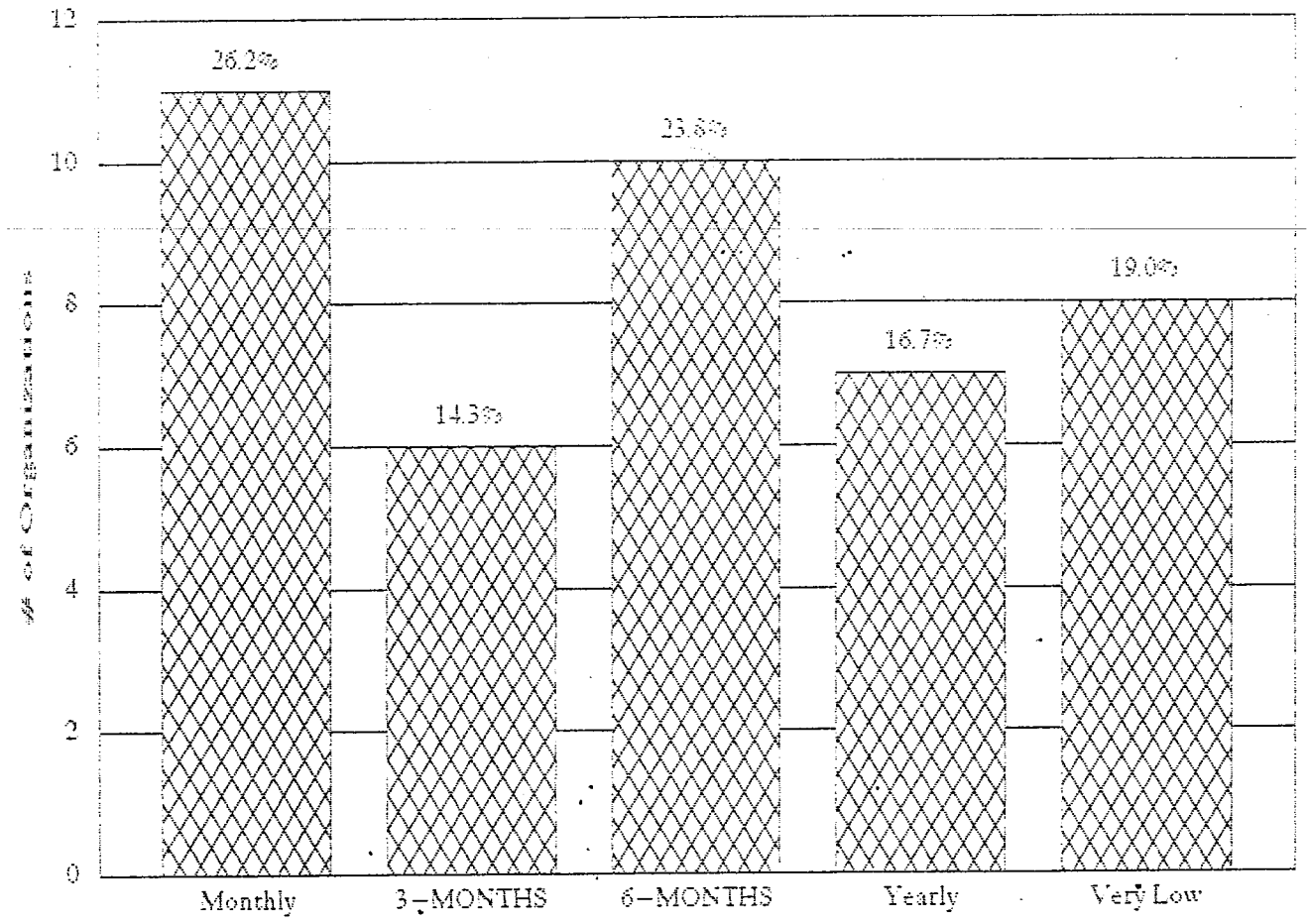
	Monthly	3-MONTHS	6-MONTHS	Yearly	Very Low
Industrial	2	1	1	1	0
Agricultural	2	0	0	0	1
Commercial	3	3	7	3	2
Bank	2	1	1	1	1
Contractor	1	0	1	1	1
Educational	0	0	0	0	0
Cultural	0	1	0	0	0
Services	0	0	0	0	0
Medical	1	0	0	1	0
Social Asso.	0	0	0	0	3
Total	11	6	10	7	8

After defining the major problems facing the business computer systems , the frequency of the maintenance is assessed. The maintenance frequency could be monthly, once every three months, once every six months, yearly, or very low. The major frequency was monthly. (Refer to Table #4_19 and Figure #4_19)

4.4 Efficiency of the Computer Systems in the Area of Sidon

Efficiency of the computer systems, in this study, is measured by terms of how much manual work and time has been saved by the computer system in addition to the satisfaction of the management of the respondent organization. Normally, any computer system has to save the manual work of the organizations' process. According to the findings of the study, the average manual work saving is 63.50%. The social associations show the highest percentage (75%) in saving manual work. Moreover, the majority of the respondent organizations have reported the 75% choice (median = 3 stands for 75%). Only 16.3% have reported a saving in the manual work for 25%. For more details refer to Exhibit #4_1.

Fig 4_19 Frequency of Maintenance of the Computer Systems in the area of Sidon



NICOL HALL

Exhibit # 4.1

Page 22 SPSS/PC+

SV_MANU

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	1	2.3	2.3	2.3
25%	1	6	14.0	14.0	16.3
50%	2	11	25.6	25.6	41.9
75%	3	15	34.9	34.9	76.7
More than 75%	4	10	23.3	23.3	100.0
	TOTAL	43	100.0	100.0	

Page 23 SPSS/PC+

SV_MANU

Count	Midpoint	
1	.13	
0	.38	
0	.63	
0	.88	
6	1.13	
0	1.38	
0	1.63	
0	1.88	
11	2.13	
0	2.38	
0	2.63	
0	2.88	
15	3.13	
0	3.38	
0	3.63	
10	3.88	

I....+....I....+....I....+....I....+....I....+....I
0 4 8 12 16 20

Histogram Frequency

Page 24 SPSS/PC+

SV_MANU

Mean	2.628	Std Err	.163	Median	3.000
Mode	3.000	Std Dev	1.070	Variance	1.144
Kurtosis	-.555	S E Kurt	.709	Skewness	-.411
S E Skew	.361	Range	4.000	Minimum	0.0
Maximum	4.000	Sum	113.000		

Valid Cases 43 Missing Cases 0

Saving time is the next point in the efficiency assessment. According to the findings of the study, the business computer systems have saved 66.75%. The respondent industrial and the agriculture organizations have shown the highest percentage in saving time in their administrative process which is 75.0%. Moreover, the majority of the respondent organizations have reported the 75% choice (median = 3 stands for 75%). Only 14.0% have reported a saving in the manual work for 25%. For more details refer to Exhibit #4_2.

Finally, the last point in the efficiency assessment is the satisfaction of the management from using the computer in their processes. According to findings of the study, the general percentage of satisfaction is 67.25%. The banks have registered the highest rate of satisfaction in the area of Sidon which is 78.50%. Moreover,the majority of the respondent organizations have reported that the 75% choice (median = 3 stands for 75%). Only 7.0% have reported a savings in the manual work for 25%. For more details refer to Exhibit #4_3.

The study has shown that the efficiency of the business computer system in Sidon is 65.75% and the highest percentage is recorded by the commercial

NICOL HALL

Exhibit # 4.2

Page 25 SPSS/PC+

SV_TIME

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	1	2.3	2.3	2.3
25%	1	5	11.6	11.6	14.0
50%	2	8	18.6	18.6	32.6
75%	3	14	32.6	32.6	65.1
More than 75%	4	15	34.9	34.9	100.0
	TOTAL	43	100.0	100.0	

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SV_TIME

```
  Count   Midpoint
      1        .13 |--
      0        .38 |
      0        .63 |
      0        .88 |
      5       1.13 |----------
      0       1.38 |
      0       1.63 |
      0       1.88 |
      8       2.13 |--------------------
      0       2.38 |
      0       2.63 |
      0       2.88 |
     14       3.13 |----------------------------------
      0       3.38 |
      0       3.63 |
     15       3.88 |---------------------------------------
                   I....+....I....+....I....+....I....+....I....+....I....+....I
                   0         4         8        12        16        20
                            Histogram Frequency
```

Page 27 SPSS/PC+

SV_TIME

Mean	2.860	Std Err	.168	Median	3.000
Mode	4.000	Std Dev	1.104	Variance	1.218
Kurtosis	-.329	S E Kurt	.709	Skewness	-.714
S E Skew	.361	Range	4.000	Minimum	0.0
Maximum	4.000	Sum	123.000		

Valid Cases 43 Missing Cases 0

NICOL HALL

Exhibit # 4.3

Page 28 SPSS/PC+

SATISFY

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	1	2.3	2.3	2.3
25%	1	2	4.7	4.7	7.0
50%	2	11	25.6	25.6	32.6
75%	3	13	30.2	30.2	62.8
More than 75%	4	16	37.2	37.2	100.0
	TOTAL	43	100.0	100.0	

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SATISFY

Count	Midpoint	
1	.13	
0	.38	
0	.63	
0	.88	
2	1.13	
0	1.38	
0	1.63	
0	1.88	
11	2.13	
0	2.38	
0	2.63	
0	2.88	
13	3.13	
0	3.38	
0	3.63	
16	3.88	

I....+....I....+....I....+....I....+....I....+....I
0 4 8 12 16 20

Histogram Frequency

Page 30 SPSS/PC+

SATISFY

Mean	2.953	Std Err	.156	Median	3.000
Mode	4.000	Std Dev	1.022	Variance	1.045
Kurtosis	.129	S E Kurt	.709	Skewness	-.745
S E Skew	.361	Range	4.000	Minimum	0.0
Maximum	4.000	Sum	127.000		

Valid Cases 43 Missing Cases 0

organizations which is 71.25%. To have a clear idea see Figure #4__20 and Table #4__20. The majority of the respondent organizations have reported the 75% choice (median = 3 stands for 75%). For more details refer to Exhibit #4_4.

4.5 Analysis of the Computer Usage

The regression analysis of the computer usage is prepared on the SPSS package. According to the findings of the study there is no factor affects the using of the computer systems in the area of Sidon. The factors (which are : age, size, employees number, and educational level of the employee) have shown no relationship to the usage of the computer systems.

4.6 Reasons for not using Business Computer Systems in the Area of Sidon

It has been mentioned previously that only 40% of the respondent organizations have computer systems. The remaining 60% have their reasons for not having computer systems. In the questionnaire, a list of four major reasons and an open choice reason show the real reasons for not

Fig.4_20 Efficiency of the Computer Systems in the Area of Sidon

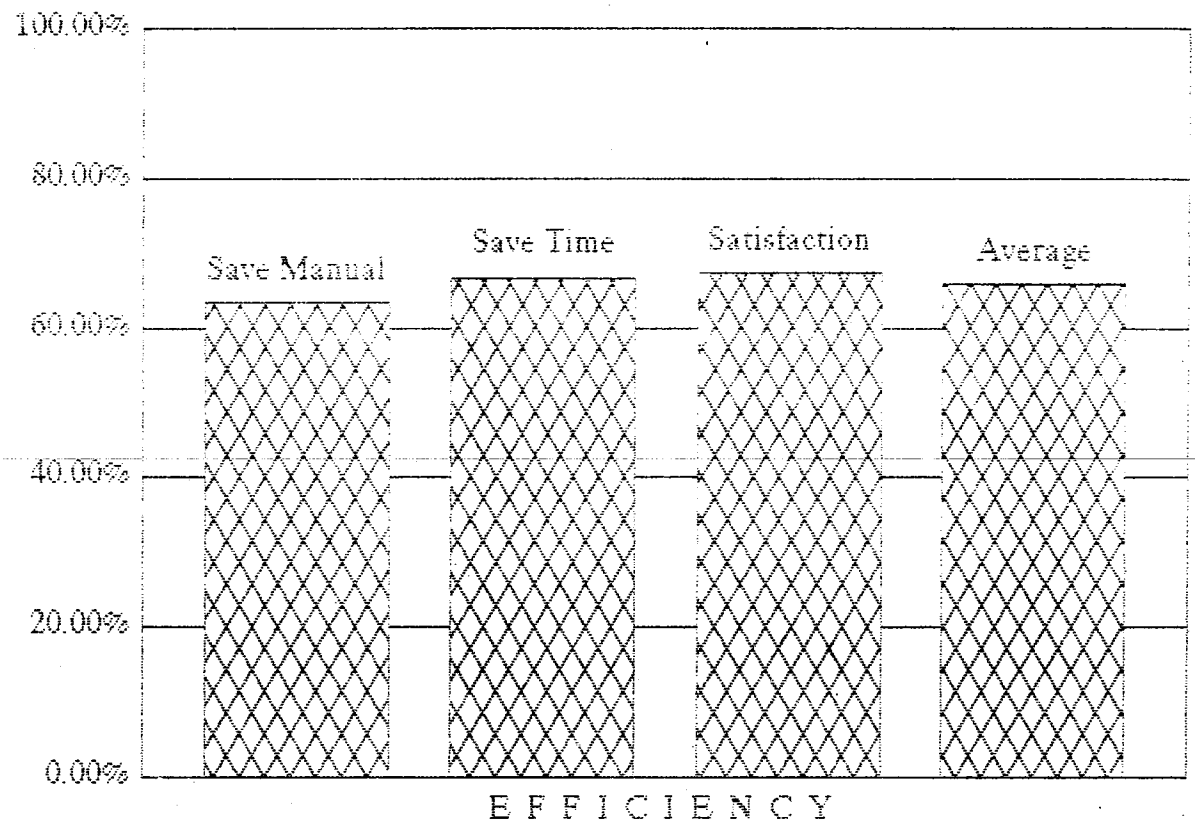


Table 4_20
Efficiency of the Computer Systems in the area of Sidon

	Save Manual	Save Time	Satisfaction	Average
Industrial	0.65	0.75	0.65	0.68
Agricultural	0.67	0.75	0.67	0.69
Commercial	0.64	0.72	0.78	0.71
Bank	0.64	0.68	0.79	0.70
Contractor	0.60	0.65	0.75	0.67
Educational	0.00	0.00	0.00	0.00
Cultural	0.50	0.50	0.50	0.50
Services	0.00	0.00	0.00	0.00
Medical	0.63	0.63	0.75	0.67
Social Asso.	0.75	0.67	0.50	0.64
Average in %	0.63	0.67	0.67	0.66

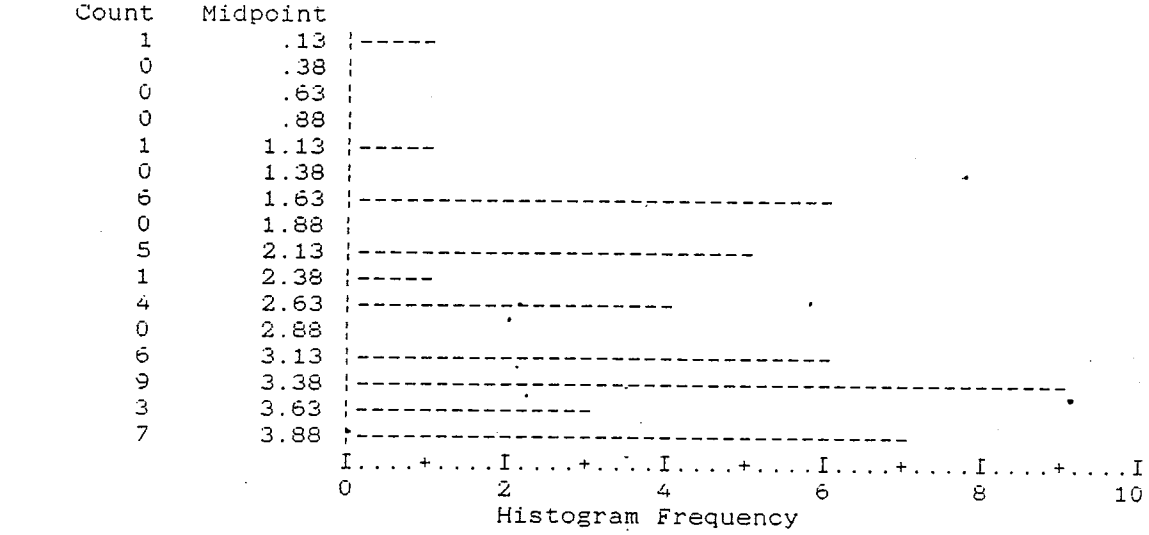
NICOL HALL

Exhibit # 4.4

EFF1

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0.0	1	2.3	2.3	2.3
	1.0	1	2.3	2.3	4.7
	1.7	6	14.0	14.0	18.6
	2.0	5	11.6	11.6	30.2
	2.3	1	2.3	2.3	32.6
	2.7	4	9.3	9.3	41.9
	3.0	6	14.0	14.0	55.8
	3.3	9	20.9	20.9	76.7
	3.7	3	7.0	7.0	83.7
	4.0	7	16.3	16.3	100.0
	TOTAL	43	100.0	100.0	

EFF1



EFF1

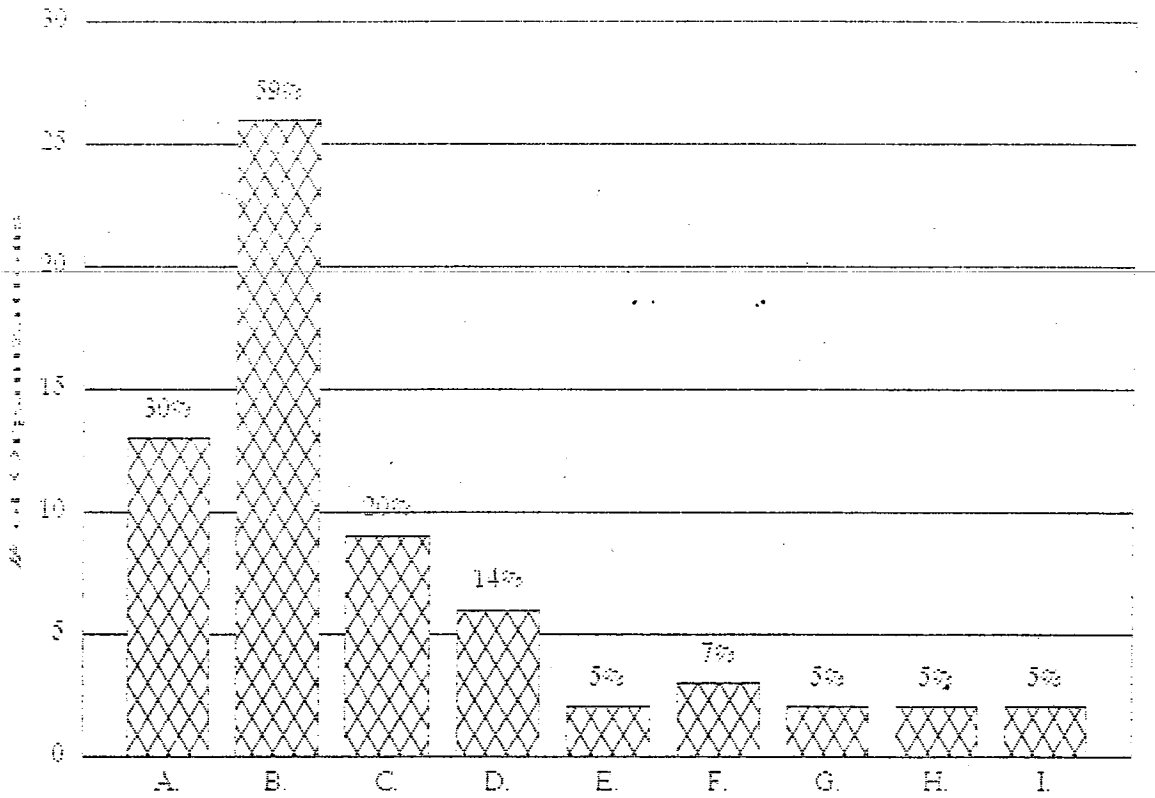
Mean	2.814	Std Err	.144	Median	3.000
Mode	3.333	Std Dev	.944	Variance	.890
Kurtosis	.316	S E Kurt	.709	Skewness	-.752
S E Skew	.361	Range	4.000	Minimum	0.0
Maximum	4.000	Sum	121.000		

Valid Cases 43 Missing Cases 0

applying computerized system in their organizations. The major reasons which have the maximum number of respondents is that organizations do feel they are in need of a computer system in the near future. The next major reason is that the respondent organizations do not consider the matter of computerizing seriously. A list of the reasons and how the different types of respondent organizations deal with them is in Table #4_21 and Figure #4__21. Three respondent medical organizations out of 4 who do not use computer systems say that they prefer to invest money in new advanced technology of the medical equipments rather than buy a computer system. A manger of a commercial organization had written the following in a questionnaire:"I do not trust the software people in Sidon and skillful personnel if they exit may not continue working in the organization".

The computer suppliers' market activity affects more or less the usage of computer systems. Twenty four respondent organizations, who do not have computer systems, out of 66 have been contacted by the computer suppliers. Fourteen of the Twenty four cases are suppliers from Sidon. For more details refer to Table #4 22.

Fig.4_21 Reasons for Not Implementing Computer Systems in the Area of Sidon



A. : Do not considered the matter seriously
B. : Do not feel they are in need of one
C. : Have not been offered a system met their requirement.
D. : We have a doubt it may be a failure
E. : Do not afford it economically
F. : Planning To
G. : Lack of skillful computer systems' personnel
H. : General Situation in Lebanon
I. : Very Young organization

Table 4_21

Reasons for not Imelementing Computer Systems in the area of Sidon

	A.	B.	C.	D.	E.	F.	G.	H.	I
Industrial									
Agricultural	0	1	0	0	0	0	0	0	
Commercial	3	4	2	1	0	0	0	1	
Bank	1	2	1	0	0	0	0	0	
Contractor	3	1	1	0	0	0	0	0	
Educational	3	1	1	1	0	3	0	0	
Cultural	1	1	0	0	0	0	0	0	
Services	1	4	2	0	1	0	0	0	
Medical	1	1	1	1	0	0	0	0	
Social Asso.	0	0	1	0	1	0	0	0	
Total	13	26	9	6	1	3	2	2	

A. : Do not considered the matter seriously
B. : Do noy feel they are in need of one
C. : Have not been offered a system met their requirement.
D. : We have a doubt it may be a failure
E. : Do not afford it economically
F. : Planning To
G. : Lack of skillful computer systems' personnel
H. : General Situation in Lebanon
I. : Very Young organization

Table 4_22

Computer Suppliers' Contacts with the Organizations in the area of Sidon

	No	YES From Sidon	
Industrial	8	5	3
Agricultural	1	0	0
Commercial	9	8	3
Bank	4	0	0
Contractor	4	1	1
Educational	4	4	1
Cultural	3	0	0
Services	6	4	4
Medical	2	2	2
Social Asso.	1	0	0
Total	42	24	14

4.7 Future Use of Business Computer Systems in the Area of Sidon

According to the findings of the study 46% of the respondent organizations expect to use computer systems in the future. Some respondents state when they will use computer system in their administrations while others state there are obstacles facing them when these obstacles are removed they will use the computer. For more information refer to Table #4__23.

Trend analysis is considered an aspect of the analysis of time-series data. It is used for forecasting by the least square technique. According to least-square forecasting technique, the statistical trend revealed from previous data on the computer usage is extrapolated into future. This trend is assumed to prevail for a number of years to come. The trend line seems it fit a straight line which minimize the deviation from such line (regression line) by the least square method. The regression equation of the trend analysis is **Y = 15 + 4x**. It was noted that the computer usage is increasing at rate of (4/0.3=) 13 computer systems per year. Trend Analysis of the time series data of the computer usage in on Exhibit #4__5.

Table 4_23
Organization expecting to Use Computer Systems in the area of Sidon

	1.Year	2.Years	3.Years	4.Years	5.Years	DEPENDING ON Situation	Economic	Size of Business
Industria	2	2	2	0	0	3	0	1
Agricultu	0	0	0	0	0	0	0	0
Commercia	3	2	2	0	0	5	1	1
Bank	1	0	1	0	0	0	0	0
Contracto	3	1	0	0	0	0	0	0
Education	1	1	0	0	0	0	2	0
Cultural	0	0	0	1	1	1	0	0
Services	0	1	1	0	0	2	0	3
Medical	1	0	0	0	0	3	0	0
Social As	0	0	0	0	0	0	1	0
Total	11	7	6	1	1	14	4	5

Table 4_24
Number of employes who has at least one compuse in Computer

	#
Industrial	0
Agricultural	0
Commercial	0
Bank	5
Contractor	3
Educational	7
Cultural	1
Services	1
Medical	1
Social Asso.	1
Total	19

Figure #4_23 Trend Analysis & Expectation of Computer Usage

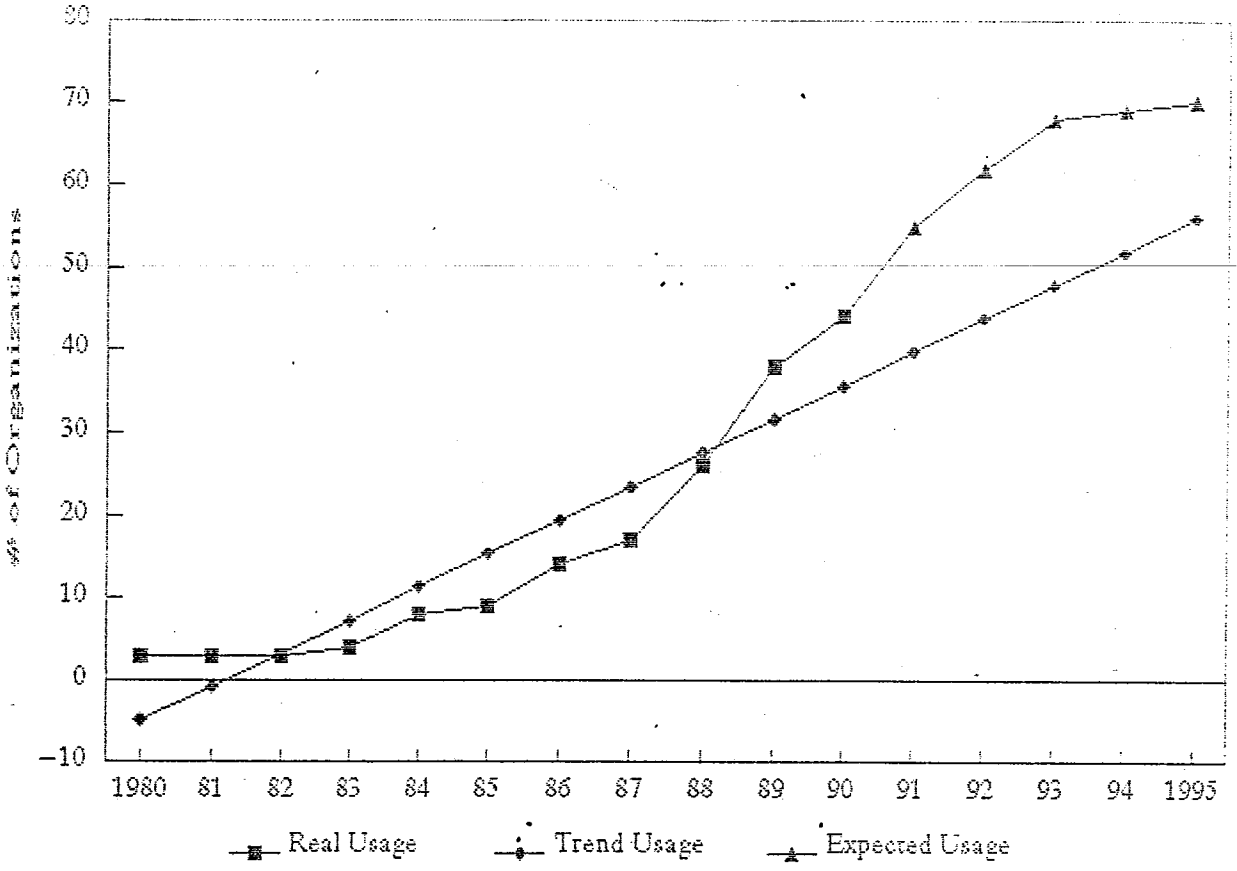


Exhibit #4_5
Trend Analysis of the Computer Usage

X	Y	x	x^2	xY	Yc	Yexp.	(Y-Yc)^2	Y^2
19S0	3	-5	25	-15	(5)	3	63	9
S1	3	-4	16	-12	(1)	3	15	9
S2	3	-3	9	-9	3	3	0	9
S3	4	-2	4	-S	7	4	11	16
S4	S	-1	1	-S	11	S	11	64
S5	9	0	0	0	15	9	40	S1
S6	14	1	1	14	19	14	29	196
S7	17	2	4	34	23	17	42	2S9
S8	26	3	9	7S	2S	26	2	676
S9	3S	4	16	152	32	3S	41	1,444
90	44	5	25	220	36	44	70	1,936
91		6			40	55		
92		7			44	62		
93		8			4S	6S		
94		9			52	69		
1995		10			56	70		

a = 15.36364
b = 4.054545

Y = 15 + 4x

r^2 = 0.92

Figure #4_23 shows the trend graph and the expectation graph. The trend analysis confirms with the expectation but with different rates.

How close are the calculated values to the actual values of the trend analysis. In other words, how well does the regression equation predict the computer usage variable on the time series sequence. The fact that the actual usage may depart from the regression line curve indicates the other forces, variables, other than time series that affect the computer usage. To determine the accuracy, r^2 is calculated. r^2 is coefficient of determination. Calculation of r^2 is on Exhibit #4_5. Since r^2 is equal to 0.92, the regression line equation is significant.

Table #4_24 shows the knowledge of the employees of the respondent organizations who do not employee a computer system. The educational organizations have shown the highest number in knowing the computer.

Many organizations have an idea about the type of hardware and data to be used in their computer system in the future.

The expected hardware to be used in the area of Sidon, according to the findings of the research, is in Table #4_25 and Figure #4_25. Seventeen out of Fifty two respondent organizations have no expectation about what hardware to be used in the future in their organizations. However, the most expected hardware type to be used in the future is the micro computer.

According to the findings of the research, the future types of data to be implemented in the are in Sidon is more or less like the present types. The major types in which the computer will be implemented are accounting (81%), payroll (56%), and stock (52%). Figure # 4__26 and Table #4_65 give a clear idea about the future types of data. Two types of data are expected to be used: grading, for the educational organizations, and library.

This chapter presented a detailed description of all findings obtained from the survey conducted.

Fig.4_23 Types of Hardware to be used in the Area of Sidon

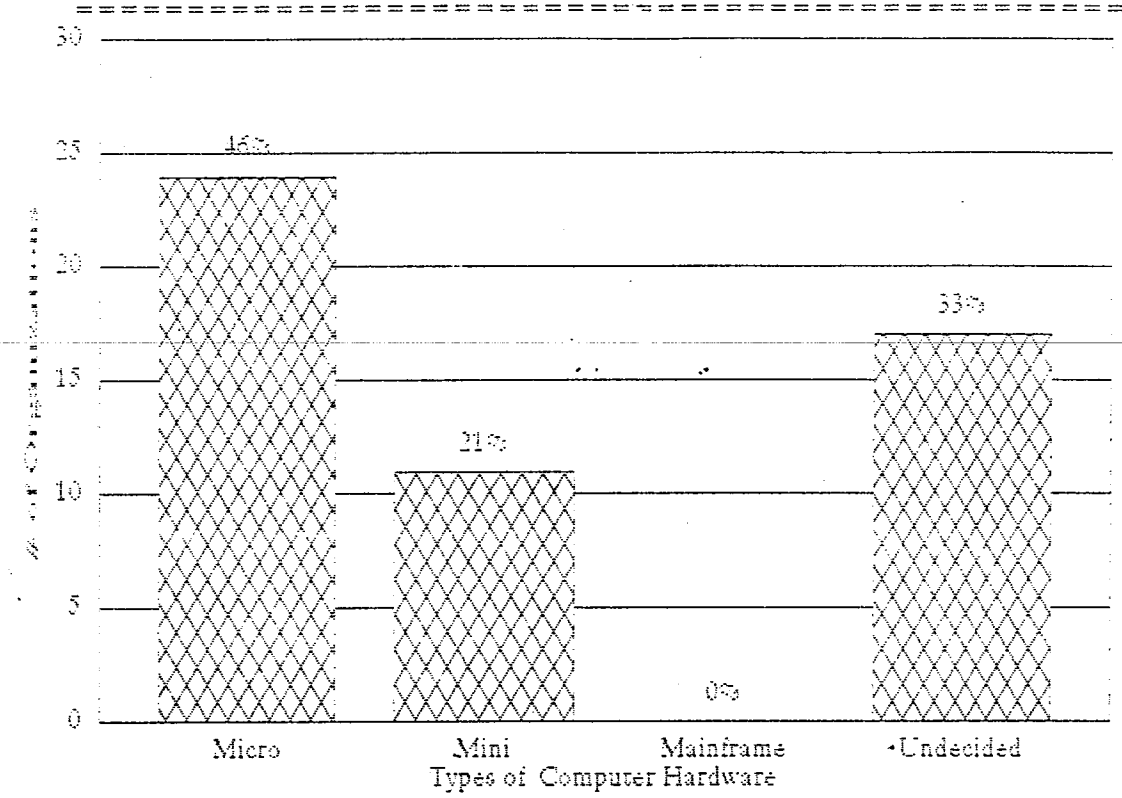


Table 4_25
Hardware to be used in the Future in the area of Sidon

	Micro	Mini	Mainframe	Undecided
Industrial	5	2	0	2
Agricultur	0	0	0	0
Commercial	9	3	0	4
Bank	0	0	0	2
Contractor	4	0	0	0
Educationa	1	3	0	1
Cultural	0	0	0	3
Services	4	2	0	2
Medical	1	1	0	2
Social Ass	0	0	0	1
Total	24	11	0	17

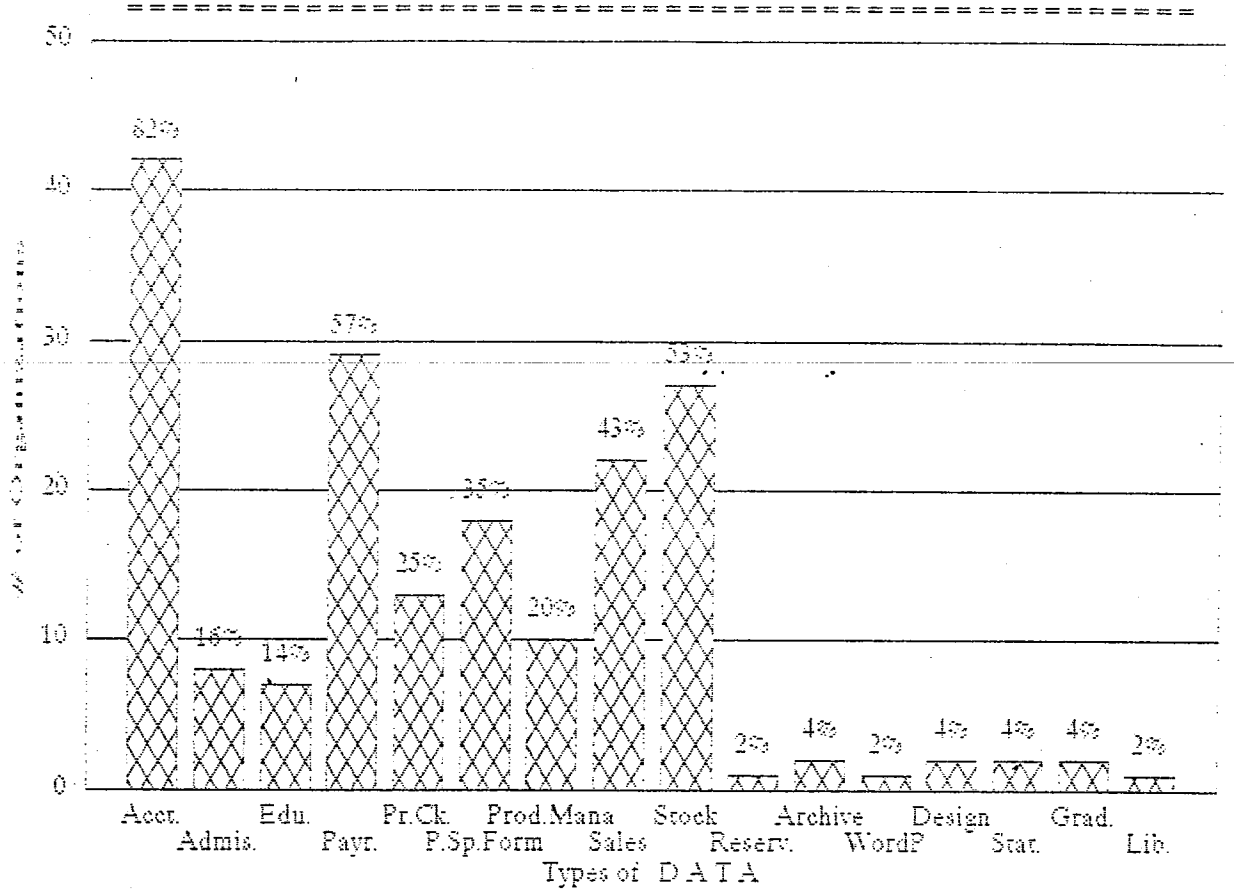
Table 4_26

Type of Data that is expected to be used in Future in the area of Sidon

	Account.	Admission	Education	Payroll	Print Chec	Printing Sp. Form	Production Management	Sales
Industrial	8	0	0	5	3	4	4	6
Agricultur	0	0	0	0	0	0	0	0
Commercial	14	0	0	7	5	6	5	13
Bank	1	0	0	1	1	1	0	0
Contractor	4	0	0	3	0	3	0	1
Educationa	5	5	5	5	3	1	1	1
Cultural	0	0	1	0	0	0	0	0
Services	5	1	0	3	0	1	0	0
Medical	4	2	0	4	1	2	0	1
Social Ass	1	0	1	1	0	0	0	0
Total	42	8	7	29	13	18	10	22

	Stock & Inventory	Reservat.	Archive	Word P.	Design	Statistics	Grading	Librar
Industrial	6	0	0	0	1	0	0	
Agricultural	0	0	0	0	0	0	0	
Commercial	13	0	0	0	0	0	0	
Bank	0	0	0	0	0	0	0	
Contractor	3	0	0	0	1	0	0	
Educational	2	0	0	0	0	0	2	
Cultural	0	0	0	0	0	2	0	
Services	0	1	2	1	0	0	0	
Medical	3	0	0	0	0	0	0	
Social Asso.	0	0	0	0	0	0	0	
Total	27	1	2	1	2	2	2	

Fig.4_26 Types of Data to be used in Future in the Area of Sidon



CHAPTER V

CONCLUSION & RECOMMENDATIONS

5.1 CONCLUSION

Although it is relatively new phenomenon, business computer system usage, has stirred considerable interest in many organizations in the area of Sidon. In fact, the declining cost of the computer hardware, especially the new micro computers PS/386 systems and the availability of the software have hasten the usage of the computer systems in the area of Sidon.

In Lebanon it could be noticed that the use of computer systems is wide spread through various organizations belonging to different sectors such as industrial, agricultural, commercial, banking, contractors, educational, cultural, services, medical, and social sectors. In the area of Sidon only 40% of the organizations use business computer systems; for instance, 28% of the Industrial, 75% of the agricultural, 51% of the commercial, 64% on the Banking, 50% of the contractors, 25% of the cultural, 33% of the medical, and 75% of the social

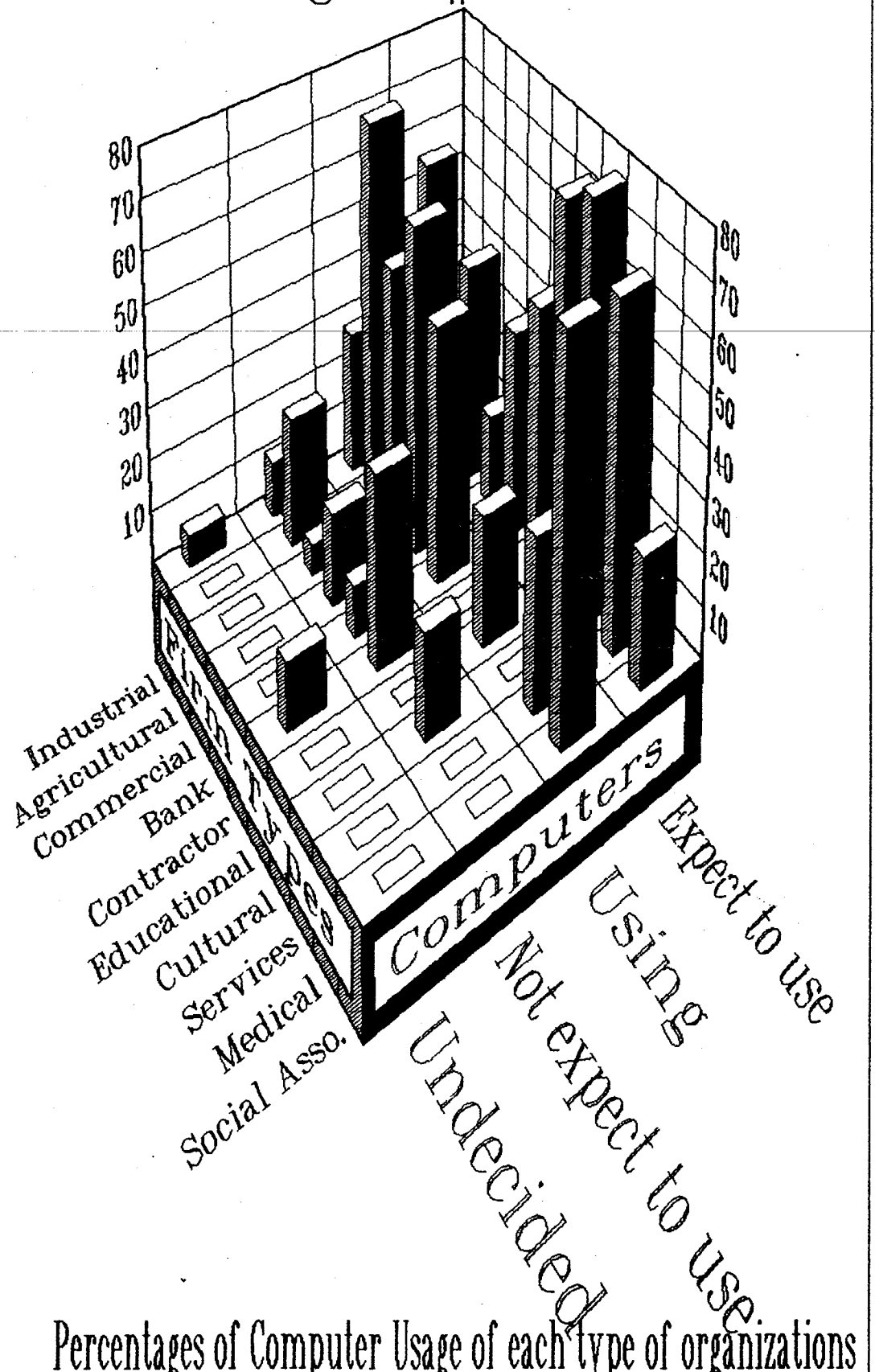
organizations. By the way, 56% of the educational organizations use the computer in teaching as any subject but they do not implement the computer usage as a business computer system.

The remaining 60% of organizations who do not use computers are classified into three different categories : 46% expect to use computer in future, 12% do not expect to use computer, and 2% undecided whether to use computer in future or not. For more details refer to table #5__1 and figure #5__1. What was noticed, however, is that most managers are still considering the use of advance computer technology as a cost rather than an asset that should be efficiently managed and guided towards the benefits of their organizations.

Table #5_1
Percentages of the Computer Usage in the area of Sidon

	Using Computer	Expect to use	Undecided	Not Expect to use
	%	%	%	%
Industrial	28	55	6	11
Agricultural	75	0	0	25
Commercial	51	43	0	6
Bank	64	18	0	18
Contractor	50	40	0	10
Educational	0	50	13	37
Cultural	25	75	0	0
Services	0	80	0	20
Medical	33	67	0	0
Social	75	25	0	0
Average	40	46	2	12

Figure #5.1



Percentages of Computer Usage of each type of organizations

In this study, business computer systems in the area of Sidon were investigated. The area of Sidon has had a relatively significant economic development in the 1980s.In the early 1980s only 3 respondent organizations out of 101 (3%) use the computer (review table #4_2B) In the late 80s and early 90s 40% of the respondent organizations use business computer systems. Moreover, the trend analysis of the computer systems usage has shown an increase consumption by 13 computer systems per year. Thus, the answer to the question raised in chapter one is the technologhy of the computer has entered the management information system in the area of Sidon.

Although the computer is being used in the of Sidon region at 40%, it does have some pitfalls such as:

1. 21% of the respondent organizations develop their software which is considered a small percentage relative to the educational level of the computer personnel who hold 53% B.S. and 3% M.S.

2. The most languages that are being used are from the third generation while the forth generation languages are not widely used.

3. Type of data is traditionally accounting and stock. Even though future organizations mostly expect to use the computer in the same manner as the precedents.

4. 47% of the computer systems are single users which indicate that the respondent organizations are using the computer in a primitive and limited way.

5. 52.3% of the main memory capacity is 640Kb Nowadays the minimum main memory for a business computer system should be at least 1Mb.

6. There is no external communications, advanced technology, being used in the area of Sidon.

7. Some managers believed that the computer could replace people.

Finally, the regression analysis has shown no relation between the other organizational characteristic and the computer usage. This implies that the computer is applied by the organizations in an adhoc way and not on a methodology. As it is mentioned in chapter II that the assessment of the methods of computerizing is cancelled from this study. This point highlights the main problem which is that most respondent organizations buy a computer system as well as buying a calculator. Furthermore, some respondent organizations do not have any idea about their own computer configuration. The result is that some respondent organizations had changed their computer systems by new ones because after two or three years they had discovered that their computer systems do not suit their operations.

5.2 RECOMMENDATIONS

Management has to play a key role in improving the computer efficiently. The business computer systems in the area of Sidon should be more productive and efficient. To be so, some steps are recommended to be taken :

1. The business computer system should be considered an asset rather than a cost.

2. A consultancy for implementing a computer system should be done by expert people before implemention even though it costs money. This cost is less than, the cost, the organization is going to pay when it discovers after two years that its computer system is not suitable for its operations. Thus, the method of computerizing should be scientific.

3. A course in Management Information Systems or computer course should be taken by at least one employee in the organization that wants to be computerized. In addition to a course in computer literacy to the managers of the organizations.

4. The hardware and the software of the computer system should serve at least for five years.

5. The software languages of the forth generation should be used more instead of using the third generation languages.

6. External communication between the computer in the organization and others may be used especially for the banking sector. But great awareness should be taken against computer viruses.

Hoping in the 1990s the business computer systems being applied in an efficient and productive way with the usage of new advanced computer technology in the area of Sidon.

APPENDIX : **THE QUESTIONNAIRE**

Assessment of Computerized Systems
in the area of Sidon

A study is held by a B.U.C. Student who is preparing for his M.B.A. degree; he is trying to find the degree in which the computerized systems are being used in the organizations and firms in Sidon's area.

Your cooperation in filling this questionnaire will help the study in reaching its goal successfully.

Thank you

---

1. The organization has been established in the year of _____.

2. The type of your organization is _____.

   (a). Industrial
   (b). Agricultural
   (c). Commercial
   (d). A bank
   (e). Contractor
   (f). Educational
   (g). Cultural
   (h). Service firm
   (i). A medical center
   (j). Social Association

3. The organization _____.

   (a). Is a branch of a mother firm outside Sidon
   (b). Consists of only one unit
   (c). Is a mother firm that has branches in Sidon
   (d). Is a mother firm that has branches outside Sidon
   (e). both c. & d.

4. The number of the employees in the organization is _____.

5. How many degree holders do you have in your organization

   (a). B.T. _____
   (b). T.S. _____
   (c). B.A. or B.S. _____
   (d). M.S. _____
   (e). Ph.D. _____
   (f). None _____

6. Do you have a computer system in your organization ?

   (a). Yes
   (b). No

---<<<<*** If No please go to page 7 ***>>>>---

7. The computer system of the organization has been installed in the year of _____.

8. The computer system _____ .

(a). is not in use.
(b). is being used since _____.

9. What is the trade mark of your computer ? _____.

10. Type of the hardware of the computer system is _____.

(a). Micro-computer PC.
(b). Micro-computer PC. with network.
(c). Micro-computer PS.
(d). Micro-computer PS. with network.
(e). Mini-computer.
(f). Mainframe-computer.
(g). Other, please specify _____

11. If more than one computer system is there any communication among them ?

(a). Yes
(b). No

12. Is there any communication with remote computer systems .

(a). Yes
(b). No

13. The hardware of the computer system in the organization consists of :

	No.	Description
(a).	___	C.P.U. & Main memory
(b).	___	Hard disk
(c).	___	Floppy diskette drive
(d).	___	Tape drive
(e).	___	Terminal
(f).	___	Printers
(g).	___	Plotters
(h).	___	Scaners

14. The capacity of the hardware of the computer system in the organization is :

(a). _____ Main Memory
(b). _____ Hard Disk(s)
(c). _____ Floppy disk drive(s)
(d). _____ Tape drive(s)

15. The operating system(s) in the organization is/are _____.

(a). MS-DOS
(b). DG-MV
(c). Unix
(d). Wang-VS
(e). CPM
(f). OS
(g). VOS
(h). Other, please specify _____.

16. Your system is best described as _____ .

(a). Single user
(b). Multi-user
(c). Multi-task
(e). b. & c.

17. You are applying _____ processing.

(a). Batch
(b). On-line
(c). Both a. & b.

18. Do you _____ your software ?

(a). Buy , please specify from _____
(b). make
(c). both a. & b.

19. Names of packages or languages used in your software.

(a). Assembly language
(b). BASIC language
(c). C language
(d). COBOL language
(e). PASCAL language
(f). DATA_BASE system
(g). Other, please specify _____

20. Your computer system is run by _____ .

(a). Your own employees
(b). A software firm
(c). a. & b.

21. The computer system is being used in _____.

(a). Accounting
(b). Admissions
(c). Education
(d). Payroll
(e). Printing checks
(f). Printing special forms.
(g). Production management
(h). Sales management
(i). Stocks & Inventory
(j). Other, please specify _____

22. The computer system has saved _____ of the manual work.

(a). below 25 %
(b). between 25% & 50 %
(c). between 51% & 75 %
(d). Above 75 %

23. The computer system has sped up_____ your operations.

(a). below 25 %
(b). between 25% & 50 %
(c). between 51% & 75 %
(d). Above 75 %

24. You are _____ satisfied with your computer system

(a). 25 %
(b). 50 %
(c). 75 %
(d). more than 75 %

25. Has there been any postimplementation auditing? _____

(a). None
(b). Once
(c). Twice
(d). Periodic

26. Your major problem with your system relates to _____.

___. Poor suppliers' maintenance
___. Unsatisfying software performance
___. Hardware failure
___. Lack of skilful EDP employees

27. The frequency of maintenance requirement is _____.

(a). more than once monthly
(b). every 3 months
(c). every 6 months
(d). every year
(e). very low

28. The educational levels of the computer department employees are :

(a). B.T. _____
(b). T.S. _____
(c). B.A. or B.S. _____
(d). M.S. _____
(e). Ph.D. _____
(f). Other, please specify _____

29. The number of the employees of your computer dept. with the following job description are :

(a). ____Controller
(b). ____Data Entry, Operator
(c). ____E.D.P. supervisor
(d). ____Programmer
(e). ____System Analyst
(f). ____Other, please specify _____.

30. Can other than the computer department employees use the computer system.

(a). Yes
(b). No

Thanks for your cooperation

31. Our reason for not implementing a computer system is that _____.

(a). we haven't considered the matter seriously
(b). we don't feel we are in need of one
(c). we haven't been offered a system that meets our requirements
(d). we have doubt that if might be a failure
(e). Other , please specify _____

32. Has any computer supplier contacted you ?

(a). Yes , please give name(s) _____ .
_____.
_____.

(b). No

33. Would you expect to use a computer system in future ?

(a). Yes
(b). No
(c). Undecided

‹‹‹** If a, please go to page **8** **›››

Thanks for your cooperation

34. You expect to use a computer system after _____ years.

35. You are interested in _____ .

(a). A Micro-computer
(b). A Mini-computer
(c). A Mainframe-computer
(d). Undecided

36. You would use the computer system in _____.

(a). Accounting
(b). Admissions
(c). Education
(d). Payroll
(e). Printing checks
(f). Printing special forms.
(g). Production management
(h). Sales management
(i). Stocks
(j). Other, please specify _____
(k). Undecided

37. How many employees have at least one course in computer? _____.

Thanks for your cooperation

Compiler A program that translates source program language statements into object code. Computer manufacturers provide a compiler for each language to be used on their computers.

Computer A data processor which can perform substantial computations, including numerous arithmetic or logical operations, without intervention by a human operator during the run.

CRT (Cathode-Ray Tube) As terminal resembling an ordinary television set that can display a large number of characters rapidly; many also have graphics capabilities.

Data Any representation such as characters or other symbols to which meaning is or might be assigned.

Database A collection of data fundamental to an enterprise.

Database management system A large and complex program that serves as an intermediary between application programs and a database.

Disk A direct access device consisting of one or more surfaces mounted on a revolving spindle. Data is recorded in concentric circles called tracks.

Diskette A flexible disk platter mainly used with microcomputers.

Dot-matrix printer A printer in which the characters are composed of small dots.

Electronic mail A computer-based document distribution system. Memos, letters, and other documents are created on CRTs and delivered electronically.

First generation computers Computers developed in the late 1940s and early 1950s. Circuits were constructed with vacuum tubes.

GLOSSARY

Application programs Programs that solve a specific user need or problem.

Assembly language A language midway between machine language (binary) and high level languages.

BASIC language **B**eginner's **A**ll-purpose **S**ymbolic **I**nstruction **C**ode. An easy-to-learn programming language. It is used primarily in educational institutions, and in business with microcomputers and small minicomputers.

Batch processing The process by which data is collected and processed in groups. Used primarily for sequential file applications.

Bit A binary digit. Bits have either of values o or 1.

Business computer system A collection of computer hardware, programs, data procedures, and trained personnel that interact to satisfy a business need.

Byte The collection of bits necessary to form one character. Some computers have eight bits per byte; other have sixteen bits per byte.

Bus A path used to carry signals such as a connection between the memory and the C.P.U. in a microprocessor.

Central Processing Unit (CPU) The portion of the computer hardware that executes programs instructions. It contains a control unit, main memory, and the arithmetic logic unit. Some definitions do not include main memory as a part of the CPU.

COBOL language **CO**mmon **B**usiness **O**riented **L**anguage. The most commonly used programming language for business applications. COBOL was developed by a committee of users and manufacturers in the late 1950s.

Floppy See diskette.

Forth generation computers Computers today. The fourth generation is characterized by a tremendous decrease in the price/performance ratio of CPUs and other large scale integrated circuity.

Hard disk See disk.

Hardware Computing equipment.

High level Language Programming languages that are closer to human language than either binary or assembler languages.

IBM International **B**usiness **M**achines Corporation. The largest manufacturer of computer hardware.

Information Knowledge derived from data.

Information System Business systems to provide information to managers.

Input (1) the data that is delivered to a data processing device from the external world; (2) the process of delivering this data to the equipment that performs the process; (3) a keyboard-actuated device that delivers this data to the equipment; contrast with output.

Input/process/output cycle The fundamental cycle of all business computer programs. Data is input, processed, and results are output. The process is repeated for all data.

I/O Devices Devices by which input may be sent to the machine or output received from it

Kb KiloByte equivalent to 1024 Byte.

Line printer A printer that prints an entire line at a time.

Machine language Sequences of computer instructions coded in binary.

Magnetic tape A medium for recording data sequentially. Data is recorded as magnetized spots.

Main memory A portion of the CPU that contains data and instructions. Programs must be bought into main memory before they can be run, and data must reside in main memory before it can be processed.

Mainframe computer A class of computers having the largest, most expensive CPUs.

Maintenance Activities to keep a computer system in working order.

Management Information System (MIS) A business system that provides past, present, and projected information about a company and its environment.

Mb MegaByte equivalent to one million Byte.

Micro computer A class of computers having the smallest, slowest, and cheapest CPUs. See also personal computer.

Mini computer A class of medium-sized computers. Larger and more expensive than microcomputers, but smaller and less expensive than mainframes.

Modem Modulator/demodulator. The hardware that converts (or reconverts) a digital signals into an analog one.

MS-Dos The most popular operating system for IBM microcomputers and their compatibles.

MV Multiple Virtual storage was designed to provide performance, reliability, and compatibility for IBM 370 and Data General minicomputer.

Network A combination of communications lines tying various locations together.

Object code A source program that has been processed by a compiler.

On-line processing Referring to a uesr's ability to interact with computer data instantly.

Operating system The set of computer programs that controls the computer's resources. It performs job, task, and data management.

Output (1) Data that is delivered by a data processing device to the external world; (2) the process of delivering this data.

Package program A program written for a user by multiple groups or organizations.

Personal Computer (PC) A microcomputer that is inexpensive enough be owned by individuals. Common provided are word processing, electronic spread sheets, and personal databases.

Program A set of instructions that directs the computer to perform a specific series of operations.

Programmer Systems development person who designs, writes, and tests programs.

Programming language A vocabulary for instructing the computer. Programming languages vary from low-level binary machine code to high level, English-like languages.

PS Personal System a new IBM series of microcomputers.

RAM Random Access Memory or main memory

ROM Read Only Memory storage unit into which the manufacturer usually stores data and programs.

Second generation computers Computers developed during the late 1950s and early 1960s. Circuits were constructed of transistors.

Secondary memory Random access devices such as disks and drums; programs are not executed from secondary memory devices but must be loaded into primary memory.

Software Instructions that control the physical hardware of the computer system.

Source code The form of a program that is understandable to humans. It is processed by compiler to become object code.

Storage hardware Equipment, such as tapes and disks, used for data storage.

Supercomputer Very Large computer and Fast computers designed for complex scientific computations.

System analysts People who design and develop all five components of a business computer system. They must be able to work closely with business users, managers, and technical data processing personnel. They need both background in both business and information systems.

Terminals A device used to communicate with a central computer from a remote location; a CRT and a Keyboard.

Third generation computers Computers developed during the late 1960s and early 1970s. Integrated circuits replaced transistors.

Users People who employ business computer systems to accomplish their jobs.

Virtual Memory VS Addressable space beyond physical memory that appears to the user as real; it is provided through a combination of hardware and software techniques.

UNIX An operating system written in the C language for super-micro computers and minis.

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